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ZOOLOGICAL RECORD

FOR 1877;

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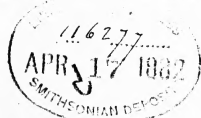
OF THE

RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY

. EDWARD CALDWELL RYE, F.Z.S., M.E.S.,
EDITOR ENT. M. MAG., LIBRARIAN TO THE ROYAL GEOGRAPHICAL SOCIETY.

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LONDON:

JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LXXIX.

LONDON:
PRINTED BY SIMMONS & BOTTEN,
4a, Shoe Lane, E.C.

Zoological Record Association

(FOUNDED 11 JANUARY, 1871;

IN CONTINUATION OF THE ZOOLOGICAL RECORD, COMMENCED IN 1865).

*Extract from the Rules adopted at the General Meeting,
held 16th March, 1871.*

"1. This Association shall be called the ZOOLOGICAL RECORD ASSOCIATION, and its object shall be to continue the publication of the 'Record of Zoological Literature.'

"2. The Association shall consist of *Members* and *Subscribers*.

"3. *Members* are entitled to receive a copy of the Annual Volume, and are liable to the extent of £5, in the event of the funds from all other sources not being equal to meet the Annual Expenditure. When this amount of £5 has once been reached, Members can either withdraw or renew their Membership, and thereby incur a fresh liability.

"4. *Subscribers* shall pay annually on the 1st of July *Twenty* shillings, but incur no other liability; in return for this they receive the Volume containing the 'Record of Zoological Literature' of the preceding year, as soon as it is published."

By a recent vote of Council of the ZOOLOGICAL RECORD ASSOCIATION, it has been resolved "to offer to each Member and to each Subscriber who has paid his subscription (£1) the issue of the next volume of the 'Zoological Record' in Parts as fast as printed, should they so prefer it."

The entire Volume only will be issued to the public, as heretofore, at the usual price (£1 10s.).

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PREFACE.

I HAVE again the pleasure of acknowledging a grant of £100 from the British Association for the Advancement of Science, and a contribution of £100 from the Government Grant Fund of the Royal Society (the fourth contribution from that source); a fifth contribution, of £50, has also been voted by the Council of the Zoological Society of London, in aid of this undertaking. I thank my fellow Recorders very sincerely for their continued co-operation. The engagements of Dr. Lütken, Recorder of the extensive and difficult groups *Vermes*, *Echinodermata*, *Cœlenterata*, *Spongozoa*, and *Protozoa*, will no longer permit him to undertake so much work as heretofore; most efficient assistants have, however, been found in Prof. F. Jeffrey Bell and Mr. Stuart O. Ridley, who have respectively undertaken the first and the last two of those groups, and who, as Assistants in the Natural History Department of the British Museum, are eminently qualified for the task. It is a matter of congratulation that the staff of Recorders now includes no less than four officers of the National Museum.

I regret that the publication of the present volume as a whole has been somewhat delayed, in some degree by my own want of leisure; but it is to be hoped that the issue of the various separate parts, as soon as completed, to the members and subscribers who have availed themselves of the resolution of the Council of the Association to that effect, may have materially diminished the consequent inconvenience.

EDWARD CALDWELL RYE.

ROYAL GEOGRAPHICAL SOCIETY,
1, Savile Row, Burlington Gardens, London,
July, 1879.

Communications, Papers, and Memoirs intended for this work should be addressed *solely* to "THE EDITOR of the Zoological Record, care of Mr. Van Voorst, 1, Paternoster Row, London." It is earnestly requested that in the case of separately-printed copies of papers so forwarded the *original pagination* be indicated.

LIST OF THE
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- Abh. Ak. Berl.*—Abhandlungen der k. Akademie der Wissenschaften zu Berlin.
- Abh. Ges. Götting.*—Abhandlungen der k. Gesellschaft der Wissenschaften zu Göttingen.
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- Abh. Ges. Nürnberg.*—Abhandlungen der naturhistorischen Gesellschaft zu Nürnberg.
- Abh. schw. pal. Ges.*—Abhandlungen der schweizerischen paläontographischen Gesellschaft (Bâle).
- Abh. Ver. Brem.*—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen.
- Am. J. Sci.* (3)—American Journal of Science and Art. Third series (New Haven).
- Am. Nat.*—American Naturalist (Boston, U. S. A.).
- Ann. Ent. Belg.*—Annales de la Société entomologique de Belgique (Brussels).
- Ann. Lyc. N. York*—Annals of the Lyceum of Natural History of New York.
- Ann. Mus. Belg.*—Annales du Musée Royal d'histoire naturelle de Belgique (Hayez, Brussels).
- Ann. Mus. Genov.*—Annali del Museo civico di Storia naturale di Genova.
- Ann. N. H.* (4)—Annals and Magazine of Natural History. Fourth series (London).
- Ann. N. York Ac.*—Annals of the New York Academy of Science.
- Ann. Sci. Nat.* (5)—Annales des Sciences Naturelles. 5me série (Paris).
- Ann. Soc. Ent. Fr.* (5)—Annales de la Société entomologique de France. 5me série (Paris).
- Ann. Soc. L. Lyon (n. s.)*—Annales de la Société Linnéenne de Lyon Nouvelle série.

- An. Soc. Esp.*—Anales de la Sociedad Española de Historia Natural (Madrid).
- An. Soc. Mod.*—Anuario della Società dei Naturalisti di Modena.
- Arb. Inst. Würzb.* (2)—Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg. Neue Folge.
- Arch. Anat. Phys.*—Archiv für pathologische Anatomie und Physiologie (Berlin).
- Arch. f. Nat.* (2)—Archiv für Naturgeschichte. Neue Folge (Berlin).
- Arch. ges. Phys.*—Archiv für die gesammte Physiologie des Menschen und der Thiere (Bonn).
- Arch. Math. Naturvid.*—Archiv für Mathematik og Naturvidenskab (Christiania).
- Arch. mikr. Anat.*—Archiv für mikroskopische Anatomie (Bonn).
- Arch. Mus. R. Jan.*—Archivos do Museu Nacional do Rio de Janeiro.
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- Arch. Néert.*—Archives Néerlandaises des Sciences exactes et naturelles (The Hague).
- Arch. Phys.*—Archives de Physiologie normale et pathologique (Paris).
- Arch. sci. nat.*—Archives des sciences physiques et naturelles (Geneva).
- Arch. Ver Mecklenb.*—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
- Arch. Zeeuwsch Genootsch. Wetensch.*—Archief. Vroegere en latere Mededeelingen voornamelijk in betrekking tot Zeeland, nitgegeven door het Zeeuwsch Genootschap der Wetenschappen (Middelburg).
- Arch. Z. expér.*—Archives de Zoologie expérimentale et générale (Paris).
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- Ber. St. Gall. Ges.*—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft (St. Gallen).
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- Bull. Buff. Soc.*—Bulletin of the Society of Natural Sciences, Buffalo.

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Bull. U. S. Nat. Mus.—Bulletin of the United States National Museum (New York).
Canad. Ent.—Canadian Entomologist (Bethune: Montreal).
CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg (Ratisbon).
Cist. Ent.—Cistula Entomologica (Janson: London).
C. R.—Comptes rendus des séances hebdomadaires de l'Académie des Sciences (Paris).
CR. Ent. Belg.—Comptes rendus des séances de la Société entomologique de Beligiques (Brussels).
Denk. Ak. Wien—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna).
Deutsche E. Z.—Deutsche entomologische Zeitschrift (Kraatz: Berlin).
Ent.—The Entomologist (Newman: London).
Ent. M. M.—Entomologist's Monthly Magazine (Douglas, McLachlan, Rye, & Stainton: London).

Ent. Monatsbl.—Entomologische Monatsblätter (Kraatz : Berlin).

Ent. Nachr.—Entomologische Nachrichten (Katter : Putbus).

Feuill. Nat.—Feuilles des jeunes Naturalistes (Mülhausen).

Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Förh. Sk. Naturf.—Fördhandlingar vid det af Skandinaviska Natursforskare och Läkare möte.

Geol. Mag.—Geological Magazine (Woodward : London).

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ (St. Petersburg).

Ibis—The Ibis (Salvin : London).

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J. de Conch.—Journal de Conchyliologie (Paris).

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Jen. Z. Nat.—Jenaische Zeitschrift für Medecin und Naturwissenschaft (Leipzig).

J. f. O.—Journal für Ornithologie (Cabanis : Leipzig).

J. G. Soc.—Quarterly Journal of the Geological Society (London).

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J. Quek. Club—Journal of the Quekett Microscopical Club (London).

J. R. G. Soc. Irel.—Journal of the Royal Geological Society of Ireland (Dublin).

J. Sc. Lisb.—Jornal de Sciencias da Academia de Lisboa (Lisbon).

J. Soc. Arts—Journal of the Society of Arts (London).

J. Zool.—Journal de Zoologie (Gervais : Paris).

L'Ab.—L'Abeille (De Marseul : Paris).

Mal. Bl.—Malakozoologische Blätter (Cassel).

MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.

Medd. Soc. Fenn.—Meddelanden af Societatis pro Fauna et Flora Fennica (Helsingfors).

Mém. Ac. Belg.—Mémoires de l'Académie Royale des Sciences de Belgique (Brussels).

Mem. Acc. Bologn.—Memorie dell' Accademia di Scienze dell' Istituto di Bologna.

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Morph. JB.—Morphologisches Jahrbuch : eine Zeitschrift für Anatomie und Entwicklungsgeschichte (Gegenbauer ; Leipzig).

MT. Münch. ent. Ver.—Mittheilungen des Münchener entomologischen Vereins (Munich).

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MT. Ver. Steierm.—Mittheilungen des naturwissenschaftlichen Vereins für Steiermark (Grätz).

Nachr. Ges. Mosc.—Nachrichten der k. Gessellschaft der Liebhaber der Naturkunde zu Moskau [see *Bull. Sci. Nat. Mosc.*].

Nachr. mal. Ges.—Nachrichtsblatt der deutschen malakozoologischen Gesellschaft (Frankfort-o.-M.).

N. Act. Ups.—Nova Acta R. Societatis scientiarum Upsaliensis.

Nat. Canad.—Le Naturaliste Canadien (Provancher : Montreal).

Nat. Tids.—Naturhistorisk Tidsskrift (Schjödte : Copenhagen).

Nature—Nature (London).

- N. Denk. schw. Ges.*—Neue Denkschriften der allgemeinen schweizerischen Gesellschaft für die gesammten Naturwissenschaften.
Niederl. Arch. Zool.—Niederländisches Archiv für Zoologie (Hoffmann : Haarlem).
N. Mag. Naturv.—Nyt Magazin for Naturvidenskaberne (Sars & Kjerulf : Christiania).
Nouv. et faits—Nouvelles et faits divers (De Marseul : Paris).
Nova Acta L.-C. Ak. Naturf.—Verhandlungen der Leopoldinisch-Carolinisch deutschen Akademie der Naturforscher (Dresden).
Nung. Ot.—Nunquam Otiosus (Schaufuss : Dresden).

- Œfv. Ak. Förh.*—Œfversigt af k. Vetenskaps Akademiens Förhandlingar (Stockholm).
Œfv. Fin. Soc.—Œfversigt af Finska Vetenskaps Societetens Förhandlingar (Helsingfors).
Opusc. Ent.—Opuscula entomologica (Thomson : Lund).
Orn. Misc.—Ornithological Miscellany (Rowley : London and Brighton).

- P. Ac. Philad.*—Proceedings of the Academy of Natural Sciences of Philadelphia.
Pal. Ind.—Palæontologia Indica : Memoirs of the Geological Survey of India (Calcutta).
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P. Cal. Ac.—Proceedings of the California Academy of Sciences (San Francisco).
P. Cambr. Phil. Soc.—Proceedings of the Philosophical Society, Cambridge.
Period. Zool. Argent.—Periodico zoologico, organo de la Sociedad entomologica Argentina (Buenos Aires).
P. E. Soc.—Proceedings of the Entomological Society of London.
Pet. Nouv.—Petites Nouvelles Entomologiques (Deyrolle : Paris).
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Phil. Tr.—Philosophical Transactions of the Royal Society (London).
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Pop. Sci. Rev.—Popular Science Review (Dallas : London).

- P. R. Irish Ac.*—Proceedings of the Royal Irish Academy (Dublin).
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P. R. Soc.—Proceedings of the Royal Society (London).
P. R. Soc. Edinb.—Proceedings of the Royal Society of Edinburgh.
P. R. Soc. Tasm.—Monthly Notices and Proceedings of the Royal Society of Tasmania.
Psyche—*Psyche*: Organ of the Cambridge [U.S.A.] Entomological Club.
P. Z. S.—Proceedings of the Zoological Society (London).

Q. J. Micr. Sci.—Quarterly Journal of Microscopical Science (London).

Rec. Geol. Surv. Ind.—Records of the Geological Survey of India (Calcutta).
Rend. Acc. Bologn.—Rendiconto dell' Accademia di scienze dell' Istituto di Bologna.
Rend. Acc. Nap.—Rendiconti dell' Accademia di scienze fisiche e matematiche (Naples).
Rend. Ist. Lomb.—Rendiconti del R. Istituto Lombardo di scienze, &c. (Milan).
Rep. Br. Ass.—Report of the British Association for the Advancement of Science.
Rep. E. Soc. Ont.—Report of the Entomological Society of the Province of Ontario (Toronto).
Rep. Ins. Mo.—Annual Report on the noxious, beneficial, and other Insects of the State of Missouri, made to the State Board of Agriculture (St. Louis).
Rep. Peab. Ac.—Annual Report of the Trustees of the Peabody Academy of Arts and Sciences (Salem, U.S.A.).
Rep. U. S. Geol. Surv.—Report of the United States Geological and Geographical Survey of the Territories (Hayden: Washington).
Rev. Montp.—Revue des Sciences Naturelles (Montpellier).
R. Z. (3)—Revue et Magasin de Zoologie pure et appliquée. 3me série (Guérin-Meneville: Paris).

SB. Ak. Wien—Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften (Vienna).
SB. bayer. Ak.—Sitzungsberichte der mathematisch-physikalischen Classe der k. bayerischen Akademie der Wissenschaften (Munich).
SB. böhm. Ges.—Sitzungsberichte der k. böhmischen Gesellschaft der Wissenschaften (Prague).
SB. Ges. Bern—Sitzungsberichte der naturforschenden Gesellschaft, Bern.
SB. Ges. Dorp.—Sitzungsberichte der Dorpater Naturforscher Gesellschaft (Dorpat).
SB. Ges. Leipzig—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.
SB. Ges. Marb.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften, Marburg.

- SB. Münch. ent. Ver.*—Sitzungsberichte des Münchener entomologischen Vereins (Munich).
- SB. Nat. Fr.*—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
- SB. niederrhein. Ges.*—Sitzungsberichte des niederrheinischen Gesellschaft für Natur- und Heilkunde (Bonn).
- SB. Soc. Erlang.*—Sitzungsberichte der physicalisch-medicinischen Societät (Erlangen).
- SB. Ver. Rheinl.*—Sitzungsberichte des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Büdingen: Bonn).
- Schr. Ges. Danz. (n.f.)*—Neueste Schriften des naturforschenden Gesellschaft zu Danzig. Neue Folge.
- Schr. Ges. Königsb.*—Schriften der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg).
- Sci. Gos.*—Science Gossip (London).
- Scot. Nat.*—The Scottish Naturalist (White: Perth).
- S. E. Z.*—Stettiner entomologische Zeitung (Dohrn: Stettin).
- Sm. misc. Coll.*—Smithsonian Miscellaneous Collections (Washington).
- Sprawozd. Kom. fizyogr.*—Sprawozdanie Komisji fizyograficznej (Cracow).
- Str. Feath.*—Stray Feathers (Calcutta).
- Sv. Ak. Handl.*—K. Svenska Vetenskaps Akademiens Handlingar (Stockholm).
- Term. füzetek.*—Természetrizsi füzetek az állat-, növény-, ásvány-, és Földtan Köréből (= Naturhistorische Hefte, Vierteljahrsschrift für Zoologie, Botanik, Mineralogie, und Geologie). Pesth.
- Tijdschr. Ent.*—Tijdschrift voor Entomologie (The Hague).
- Tr. Ac. St. Louis.*—Transactions of the Academy of Sciences of St. Louis.
- Tr. Am. Ent. Soc.*—Transactions of the American Entomological Society (Philadelphia).
- Tr. Conn. Ac.*—Transactions of the Connecticut Academy of Sciences (New Haven).
- Tr. E. Soc.*—Transactions of the Entomological Society of London.
- Tr. L. S.*—Transactions of the Linnean Society (London).
- Tr. North. Dur.*—Natural-History Transactions of Northumberland and Durham (Newcastle-upon-Tyne).
- Tr. Norw. Soc.*—Transactions of the Norfolk and Norwich Naturalists' Society (Norwich).
- Tr. N. Z. Inst.*—Transactions and Proceedings of the New Zealand Institute (Wellington).
- Tr. Z. S.*—Transactions of the Zoological Society (London).
- Verh. Ak. Amst.*—Verhandelingen der koninklijke Akademie van Wetenschappen (Amsterdam).
- Verh. Ges. Bas.*—Verhandlungen der naturforschenden Gesellschaft in Basel (Bâle).
- Verh. Ges. Freib.*—Verhandlungen der naturforschenden Gesellschaft in Freiburg.

- Verh. Ges. Würzb.* (2).—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg. Neue Folge.
- Verh. Ges. Zürich*.—Verhandlungen der naturforschenden Gesellschaft Zürich.
- Verh. L.-C. Ak.*.—[See *Nova Acta* &c.]
- Verh. Ver. Brünn*.—Verhandlungen des naturforschenden Vereins in Brünn.
- Verh. Ver. Hamb.*.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
- Verh. Ver. Heidelb.*.—Verhandlungen der naturhistorisch-medicinischen Vereins zu Heidelberg.
- Verh. Ver. Rheinfl.*.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Budge : Bonn).
- Verh. z.-b. Wien*.—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien (Vienna).
- Verst. Ak. Amst.*.—Verslagen en Mededeelingen der k. Akademie van Wetenschappen (Amsterdam).
- Vid. Medd.*.—Videnskabelige Meddelelser fra den Naturhistoriske Forening (Copenhagen).
- Z. Anat. Entwickel.*.—Zeitschrift für Anatomie und Entwicklungsgeschichte (Leipzig).
- Z. E. Ver. schles.*.—Zeitschrift für Entomologie des Vereins für schlesische Insektenkunde (Breslau).
- Z. geol. Ges.*.—Zeitschrift der deutschen geologischen Gesellschaft (Berlin).
- Z. ges. Naturw.* (2).—Zeitschrift für die gesammten Naturwissenschaften. Neue Folge (Giebel : Berlin).
- Zool. Gart.*.—Der zoologische Garten (Weinland, Bruch, & Noll : Frankfurt-o.-M.).
- Zool. Rec.*.—Zoological Record (Rye : London).
- Zool.* (3).—The Zoologist. Third Series (Harting : London).
- Z. wiss. Zool.*.—Zeitschrift für wissenschaftliche Zoologie (Siebold & Kolliker : Leipzig).

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ERRATA.

AVES.

- P. 4, line 3, for "p. 24," read "p. 240."
P. 12, line 22, add "*Nectariniidæ, Cuculidæ, Pelecanidæ.*]"
P. 46, line 14, "*Siurus*," &c., transfer from *Motacillidæ* to; *Mniotiltidæ*,
p. 45.
P. 48, TANAGRIDÆ, line 3, for "id. tom. cit.," read "P. L. Sclater &
O. Salvin, P. Z. S. 1877."
P. 59, for "CASUARIDÆ," read "CASUARIIDÆ."

CRUSTACEA.

- P. 11, *Fisheria* and *Platypes*, Lockington, dele the ? from references to
g. n.
P. 14, line 22, for "*Heteractæa pilosa*, g. ? and sp. nn.," read "*Heteractæa*
pilosus [-sa], g. & sp. nn."

ZOOLOGICAL RECORD

FOR 1877.

MAMMALIA.

BY

EDWARD RICHARD ALSTON, F.L.S., F.Z.S., &c.

AMONG the works published during the year, attention may be specially directed to Coues' and Allen's exhaustive work on the Nearctic Rodents [*infra*, p. 3], and to the latter's valuable monograph of the recent and extinct American Bisons [p. 1]. Flower has reviewed the existing Ziphoid Whales [p. 14], Doran has described the auditory ossicles of many Mammals [p. 5], and Garrod has further investigated the anatomy of the Ruminants [p. 3]. Much has been added to our knowledge of the interesting fauna of New Guinea and the adjacent islands, new forms having been described by Peters & Doria [p. 24], Milne-Edwards [p. 24], Gervais [p. 6], E. Pierson Ramsay [pp. 6 & 8], Dobson [p. 10], and Alston [p. 8]; the most important discovery being the existence of Monotremes beyond the limits of the Australian continent [p. 24]. In palæontology much work has been done in Europe by Leith Adams [pp. 5 & 8], Busk [p. 2], Rütimeyer [p. 6], and Van Beneden [p. 7]; in India by Lydekker [p. 5]; and in America by Leidy [p. 4], Marsh [p. 5], and Cope [p. 2].

THE GENERAL SUBJECT.

ALLEN, J. A. The American Bisons, Living and Extinct. Mem. Mus. C. Z. iv. No. 10, pp. 1-246, pls. i.-xii. (1876). Also simultaneously issued as Mem. Geol. Surv. Kentucky, i. pt. ii.

An important and exhaustive monograph, describing the extinct species 1877. [VOL. XIV.]

and the habits and distribution of the recent, the rapid extermination of which is illustrated by a coloured map.

ALLEN, J. A. History of the American Bison. Rep. U. S. Geol. and Geogr. Surv. of Terr. 1875, pp. 443-587 (1876).

A reprint of last paper, with the extinct species and illustrations omitted and new matter added.

— The Influence of Physical Conditions in the Genesis of Species. Radical Review, i. pp. 108-140.

Sums up the author's observations on the geographical variation of N. American Mammals and Birds. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 2.]

— [See COUES, E.]

ALSTON, E. R. [See DANFORD, C. G.]

ARLOING, S. Application de la Méthode Graphique à l'étude du Mécanisme de la Deglutition chez les Mammifères et les Oiseaux. Ann. Sci. Nat. (6) vi. art. 1, pp. 94.

BETTANY, G. T. [See PARKER, W. K.]

BRONN, H. C. [See GIEBEL, C. G.]

BUCKLEY, T. E. On the Past and Present Geographical Distribution of the larger Mammals of South Africa. P. Z. S. 1877, pp. 452-456.

Notes on the diminution in number of Zebras, Antelopes, &c. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 3.]

BUSK, G. On the Ancient or Quarternary Fauna of Gibraltar, as exemplified in the Mammalian Remains of the Ossiferous Breccia.

Tr. Z. S. x. pp. 53-136, pls. i.-xxvii.

The remains described belong to the genera *Felis*, *Hyæna*, *Canis*, *Ursus*, *Elephas*, *Rhinoceros*, *Equus*, *Sus*, *Cervus*, *Capra*, *Bos*, and *Lepus*. The aspect of the fauna is Quarternary, but the forms are mostly of African affinities.

CALDERON, S. On the Fossil Vertebrata hitherto discovered in Spain. J. G. Soc. xxxiii. pp. 124-133.

Contains a list of over 40 species of fossil Mammals. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 3.]

CATON, J. D. The Antelope and Deer of America. New York: 1877, 8vo, pp. 426.

Contains interesting original notes on the characters and habits of the Prong-horn and American Deer, illustrated with numerous woodcuts.

COPE, E. D. Descriptions of New Vertebrata from the Upper Tertiary Formations of the West. P. Am. Phil. Soc. xvii. [*Mammalia*] pp. 219-227.

Describes some new fossil genera and species of *Quadrupana* (?), *Carnivora*, *Proboscidea*, and *Ungulata*.

— Report upon the Extinct Vertebrata obtained in New Mexico in 1874. Wheeler's Rep. U. S. Geol. Surv. West. of 100th Merid. iv. [Not seen by the Recorder; *cf.* Am. Nat. 1877, pp. 750-753.]

COUES, E. *Fur-bearing Animals: a Monograph of North American Mustelidæ*. U. S. Geol. Survey of Territories (Hayden); Miscellaneous Publications, No. 8. Washington: 1877, 8vo, pp. 348, pls. xx.

Contains also accounts of other North American and exotic fur-bearing animals.

— . Precursory Notes on American Insectivorous Mammals, with descriptions of new species. Bull. U. S. Geol. Surv. Terr. iii. pp. 631-653.

Several new sub-genera and species are described [*Soricidæ*].

— & ALLEN, J. A. *Monographs of North American Rodentia* [Rep. U. S. Geol. Surv. xi.]. Washington: 1877, 4to, pp. 1091, pls. vii.

A valuable and exhaustive series of monographs of the Nearctic families of Rodents, including the extinct forms; the number of species is very greatly reduced. An appendix by T. GILL and E. COUES contains a very full bibliography of N. American Mammals and of all works on Mammals published in that Continent.

DALLAS, W. S. [See DUNCAN, P. M.]

DANFORD, C. G., & ALSTON, E. R. *On the Mammals of Asia Minor*. P. Z. S. 1877, pp. 270-281, pl. xxxi.

Thirty-eight species are enumerated, of which one [*Muridæ*] is described as new.

DORAN, A. *On the Comparative Anatomy of the Auditory Ossicles of the Mammalia*. P. R. Soc. xxv. pp. 101-108.

— . *Morphology of the Mammalian Ossicula auditûs*. P. L. S. xiii. (abstract), pp. 185-189.

These papers are preliminary to an important memoir, which will be published in full in the Tr. L. S.

DUNCAN, P. M. *Cassell's Natural History*. Vol. i. London: 1877, 4to, pp. 384.

The first volume of a popular illustrated work, edited by P. M. Duncan; the *Quadrupeds* are treated of by the Editor and J. Murie, the *Lemuroidea* by J. Murie, and the *Chiroptera* by W. S. Dallas.

FABER, — . *Der Bau der Iris des Menschen und der Wirbelthiere, mit besonder Berücksichtigung ihrer Musculatur*. Leipzig: 1876.

[Not seen by the Recorder; cf. Arch. f. Nat. 1877, ii. p. 58.]

FEILDEN, H. W. *On the Mammalia of North Greenland and Grinnell-Land*. Zool. 1877, pp. 313-321, 353-361.

Notes on the Mammals observed during Nares's Expedition; 13 species are enumerated, viz., 4 land Carnivores, 3 Pinnipeds, 2 Cetaceans, 2 Ungulates, and 2 Rodents.

FITZINGER, L. F. *Der Hund und seine Racen*. Wien: 1876.

[Not seen by the Recorder; cf. Arch. f. Nat. 1877, ii. p. 80.]

GARMAN, W. S. *On the Variation in the Colours of Animals*. P. Am. Ass. 1876, pp. 187-204.

Remarks on the effect of physical causes; Mammals are treated of at pp. 197-203.

GARROD, A. H. Notes on the Visceral Anatomy and Osteology of the Ruminants, with a Suggestion regarding a Method of expressing the Relations of Species by means of Formulæ. P. Z. S. 1877, pp. 2-18.

Numerous observations on the stomach, liver, generative organs, brain, and skull in the *Cervidæ* and *Bovidæ*. The placental cotyledons are few in the former, numerous in the latter, and the names *Oligocotyledontophora* and *Polycotyledontophora* are proposed for the two families. The various types of antlers in the *Cervidæ* are considered to depend on the development of either the anterior or posterior primary division of the beam. Finally, a method of indicating the relationship of species by letters and figures is proposed.

— On the Mechanism of the Invertebral Substance, and on some effects of the Erect Position of Man. *Tom. cit.* pp. 48-50.

GERVAIS, P. Énumération de quelques ossements d'Animaux Vertébrés recueillis aux environs de Reims. J. Zool. vi. pp. 74-79.

GERVAIS, P. [See VAN BENEDEN, P. J.]

GIEBEL, C. G. Dr. H. G. Bronn's Klassen und Ordnungen des Thier-Reichs, Abth. v., Mammalia, Nos. 13-16. Leipzig & Heidelberg: 1877, 8vo, pp. 225-304, pls. xlviii.-lxi.

In these parts the account of the teeth is completed, and that of the skeleton entered upon. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 4].

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HANOVER, —. La Rétine de l'Homme et des Vertébrés, Mémoire histologique et physiologique. Copenhague: 1876, 4to.

[Not seen by the Recorder; *cf.* Arch. f. Nat. 1877, ii. p. 58.]

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[Not seen by the Recorder; *cf.* Isis, 1877, pp. 48 & 49; Arch. f. Nat. 1877, p. 8. *Infra*, p. 12.]

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Notes on 28 species, of which 5 belong to the Stoney Bed and Norwich Crag, 11 to the Forest Bed, and the remainder to Post-glacial deposits.

KINLOCH, A. A. A. Large Game Shooting in Thibet and the North West. London: 4to, 1st Ser. 1869, pp. 68; 2nd Ser. 1876, pp. 64.

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LEIDY, J. Description of Vertebrate Remains, principally from the Phosphate Beds of South Carolina. [Mammalia]. J. Ac. Philad. (2) viii. pp. 209-232, pls. xxx.-xxxiv.

Describes remains, many of them Cetacean [*Ziphiidæ*], and for the most part previously named by the author.

LEITH ADAMS, A. Monograph of the British Fossil Elephants. Part i. Pal. Soc. 1877, pp. 1-68, pls. i.-v. [*cf. infra*, p. 15].

— Observations on remains of the Mammoth and other Mammals from Northern Spain. J. G. Soc. xxxiii. pp. 537-540.

— Observations on the remains of Mammals found in a Fossil State in Ireland. J. Dubl. Geol. Soc. iv. pp. 246-248.

Ten species only are recognized as well authenticated.

LYDEKKER, R. Notices of New and other Vertebrata from Indian Tertiary and Secondary Rocks. Rec. Geol. Surv. Ind. x. [Mammals] pp. 30-34.

— Notices of new or rare Mammals from the Siwaliks. *Tom. cit.* pp. 76-83.

These papers contain short notices of species, many of them new, of *Felidæ*, *Viverridæ*, *Canidæ*, *Ursidæ*, *Elephantidæ*, *Dinotheriidæ*, *Equidæ*, *Anthracotheriidæ*, *Merycopotamidæ*, *Hyopotamidæ*, *Hippopotamidæ*, and *Suidæ*.

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MALM, A. W. Göteborgs och Bohusläns Fauna, Rygggradsdjuren. Göteborg : 1877, 8vo [Mammalia, pp. 52-60, 125-160].

63 species are recorded as natives of or visitors to the Swedish provinces of Göteborg and Bohuslän, of which 21 are Cetaceans. Some strange novelties in nomenclature are introduced. [*Cf. C. CEDERSTRÖM, infra*, p. 8].

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Contains first notices of several new genera and species [*Rhinocerotidæ*, *Tapiridæ*, *Bovidæ*, *Sciuridæ*, *Ancyclotheriidæ*], including the first N. American Miocene Edentates and the oldest known Rhinoceros.

— Introduction and Succession of Vertebrate Life in America. *Tom. cit.* pp. 337-378.

A valuable summary of the results of recent palæontological work, regarded in relation to evolution, in the form of an Address delivered to the American Association at Nashville.

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Contains notes on the Mammals of Japan (pp. 75-87), of the Philip-

pires (pp. 193-196), of Siam (pp. 217-221), and of the Eastern Archipelago (pp. 248-261), as well as a list of the species collected or observed (pp. 362-365).

MESSING, W. Recherches anatomiques sur les Testicules des Mammifères, et en particulier sur le corps d'Highmore. Dorpat: 1877.

[Not seen by the Recorder; cf. J. Zool. vi. p. 258.]

MILNE-EDWARDS, A. Note sur quelques Mammifères nouveaux provenant de la Nouvelle-Guinée. C. R. lxxxv. pp. 1079-1081.

One new sub-genus and three new species [*Muridae*, *Phalangistidae*] are described.

MURIE, J. [See DUNCAN, P. M.]

NATHUSIUS, H. v. Ueber die sogenannten Leporiden. Berlin: 1876.

[Not seen by the Recorder; cf. Arch. f. Nat. 1877, ii. p. 87 (*et infra*, p. 22)].

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Appears to be mainly a reproduction of the author's papers on these subjects in Phil. Tr. and Tr. Z. S.

PARKER, W. K., & BETTANY, G. T. The Morphology of the Skull. London: 1877, sm. 8vo, pp. 348.

As in a former memoir of Parker's [cf. Zool. Rec. xi. p. 4], the Pig is taken as a type of the *Mammalia*, and its cranial development is fully worked out.

PETERS, W. Uebersicht über die während der sibirischen Expedition von 1876 von Hrn. Dr. O. Finsch gesammelten Säugethiere, Amphibien und Fische. MB. Ak. Berl. 1877, pp. 734-738.

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RAMSAY, E. P. Zoology of the "Chevert": Mammals. P. Liun. Soc. N. S. W. ii. pp. 7-15.

Notes on 12 species of Mammals collected, during the cruise of H.M.S. "Chevert," in North Australia and New Guinea. Three are new [*Pteropodidae*, *Peramelidae*, *Macropodidae*.]

RÜTIMEYER, L. Die Rinder der Tertiär-Epoche, nebst Fortstudien zu einer natürlichen Geschichte der Antilopen. Part i. Abh. schw. pal. Ges. iv. art. 2, pp. 1-72, 3 pls. i.-iii.

Devoted to the general affinities of the various groups of *Pecora*, especially to those of the Antelopes [cf. *infra*, p. 19]. The plates are published in advance of pt. 2, and illustrate remains of *Probubalus*, *Leptobos*, *Bubalus*, *Bucapra*, and *Amphibos*.

RYDER, J. A. On the Laws of Digital Reduction. Am. Nat. 1877, pp. 63-607.

SCHÄFFER, E. A contribution to the history of development of the Guinea Pig. Part ii. [*Cf. Zool. Rec. xiii. Mamm. p. 6.*] *J. Anat. Phys.* xi. pp. 332-347, pls. x. & xi.

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A list of 59 species, some of them of considerable interest, with brief notes on their distribution in Poland.

TAUBER, —. Tandannelse og Tandudvikling hos Hvirvelddyrene, Jagtagelser og Bemærkninger. Kjöbenhavn : 1876.

[Investigations into the structure and development of the teeth in Vertebrates. Not seen by the Recorder; *cf. Arch. f. Nat.* 1877, ii. pp. 58 & 122; *infra*, pp. 8 & 22.]

THIELMANN, M. VON. Streifzüge im Kaukasus, in Persien, und in der Asiatischen Türkei. Leipzig : 1875. [English translation by C. Heneage; London : 1875.]

Contains general notes on the Mammals. [*Cf. Zool. Gart.* 1877, p. 337.]

TROSCHER, F. H. Bericht über die Leistungen in der Naturgeschichte der Säugethiere während des Jahres 1876. *Arch. f. Nat.* 1877, ii. pp. 57-96.

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VAN BENEDEN, P. J. Description des Ossements Fossiles des environs d'Anvers. 1^{re} Partie. *Ann. Mus. Belg.* i. pp. 1-88, pls. i.-xviii.

The remains illustrated are those of Walrusses and Seals. [*Phocidæ, Trichechidæ.*]

—, & GERVAIS, P. Ostéographie de Cétacés Vivantes et Fossiles. Paris : 1877; text (4to) livrs. 15 & 16; atlas (folio) livrs. 15 & 16.

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WAGNER, R. v. Ueber die Bewegung der vierfüssigen Thiere aus den Gattungen *Equus*, *Bos*, *Cervus*, *Ovis*, *Canis*, *Sus*, u. s. w. *Arch. Anat. Phys.* 1877, pp. 424-433, pl. xix.

E. R. ALSTON describes a collection of Rodents and Marsupials from New Ireland and the vicinity, containing six species, of which three are new [*Muridæ*, *Macropodidæ*]; *P. Z. S.* 1877, pp. 123-127, pls. xviii. &

* *Orcella*, subg. n., J. E. Gray, *Cat. Seals B.M.*, 1866, p. 285, amended as *Orcella* by J. Anderson, *P. Z. S.* 1871, p. 142, appears to have escaped record both by Von Marschall and in *Zool. Rec.* iii.—Ed.

xix. E. PIERSON RAMSAY examines another part of the same collection, and describes the same species and a fourth [*Peramelidae*], P. Linn. Soc. N. S. W. i. pp. 307-310 & 376, ii. pp. 15-19. Cf. E. R. ALSTON, P. Z. S. 1877, pp. 743 & 744.

W. BOYD DAWKINS gives further notes on the Mammal-fauna of the caves of Creswell Crags. [Cf. Zool. Rec. xiii. *Mamm.* p. 8]. J. G. Soc. xxiii. pp. 589-612.

J. BROOKING ROWE revises notes by the late J. COUCH on 43 species of Cornish Mammals. J. Inst. Cornw. 1877, pp. 396-403.

C. CEDERSTRÖM gives a list of 25 species found in the North of Bohuslän, Sweden; Öfv. Ak. Förh. 1876, No. 4, pp. 57 & 58 [Cf. MALM, *suprà*, p. 5].

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H. W. HENSHAW. Notes on Mammals taken and observed in California in 1875; given in Wheeler's Rep. Geogr. Surv. W. of 100th mer. 1876, pp. 305-312.

W. J. HOFFMAN gives notes on 37 species of Mammalia observed near the Grand River, Dakota Territory. P. Bost. Soc. xix. pp. 94-102.

A. LEITH ADAMS enumerates 12 species of fossil Mammals found in the caves and aluvial deposits of Malta; J. G. Soc. xxxiii. p. 187. He has popular notes on "Ancient and Extinct British Quadrupeds"; Zool. 1877, pp. 121-149.

J. LUMSDEN, Jnr., gives notes on 26 species of Mammals found in the neighbourhood of Loch Lomond. P. N. H. Soc. Glasg. iii. pp. 186-191.

E. MARNO remarks on various Mammals observed on the Tura-el-chadrah [Upper Nubia]. Zool. Gart. 1877, pp. 4-8.

O. F. VON MÖLLENDORFF makes observations on the Mammals of the province Chihli, with notes on their Chinese names; J. N. China Soc. (n.s.) xi. pp. 46-75.

P. OLSSON gives notes on 31 species of Mammals found in Jemtland; Öfv. Ak. Förh. 1876, No. 3, pp. 105-115.

J. A. RYDER remarks on the fact that colour-variations are generally symmetrical in wild and asymmetrical in domestic animals. P. Ac. Philad. 1877, pp. 272-273.

R. A. STERNDALE, in "Seonee, or Camp-life on the Satpura Range" (London: 1877), gives a list of the Mammals of the Seonee District of Central India (Appendix, pp. 421 & 422).

— STRUCK enumerates 57 existing and 14 extinct species as natives of Mecklenburg. Arch. Ver. Mecklenb. xxx. pp. 23-119.

P. TAUBER discusses the conformation and development of the teeth of Vertebrates. Nat. Tids. 1876, [J. Zool. vi. 45.]

— THIEHLENS gives notes on some Canadian Mammals; Boll. Soc. Trieste, ii. p. 14 *et seq.* [Arch. f. Nat. 1877, ii. p. 70.]

F. G. WATERHOUSE gives a list of the Mammals of South Australia, enumerating 70 species, in Hareus's "South Australia," London, 1876, pp. 282-285.

H. WEYENBERGH gives a list of Argentine Mammals in R. Napp's "Die Argentinische Republik," Buenos Aires: 1876, 8vo, pp. 151-156.

MONODELPHIA.

QUADRUNANA.

SIMIIDÆ.

R. HARTMANN has notes on the characters of the Gorilla and Chimpanzee, SB. nat. Fr. 1876, pp. 22-26; and on the anatomy of the hip-joint in the Anthropoid Apes, *op. cit.* 1877, pp. 85-89.

A. B. MEYER, in "Notizen über die Anthropomorphen Affen des Dresdener Museums," fully describes and figures the specimens of *Simia*, *Hylobates*, and *Troglodytes* in that collection. MT. Mus. Dresd. i. pp. 223-247, pls. xi.-xxiii.

Troglodytes niger. The osteology and dentition of the supposed Gorilla of the Dresden Zoological Gardens [*cf.* Zool. Rec. xiii. *Mamm.* p. 9] are described and figured by A. B. Meyer, *tom. cit.* pp. 237-241, pls. xi.-xxiii.; the viscera and brain by T. L. W. von Bischoff, *tom. cit.* pp. 250-260. H. Bolan has notes on the same individual; Verh. nat. Ver. Hamb. 1877, pp. 26-30. G. v. Hoffmann describes the reproductive organs of a female; Z. f. geburtsch. u. gynäk. ii. pp. 1-8, pls. i. & ii.

Gorilla savagii. W. v. Bischoff minutely describes and figures the brain of a young male; SB. bayer. Ak. 1877, pp. 96-137, 2 pls. A young Gorilla formerly alive in Wombwell's Menagerie, figured by J. Wolf from a photograph; P. Z. S. 1877, pl. xxxv. Note on same and on the Berlin specimen; P. L. Sclater, *tom. cit.* pp. 303 & 304. Notes on the death and post-mortem examination of the Berlin Gorilla [*cf.* Zool. Rec. xiii. *Mamm.* p. 9]; — Broesike, SB. nat. Fr. 1877, pp. 262-267. On a visit to the same; J. von Fischer, Zool. Gart. 1877, pp. 165-170.

Hylobates leuciscus. On a case of anomalous dentition; M. Lessona, Atti Acc. Tor. xii. pp. 326-328, pl. vi.

Hylobates leucogenys. A specimen living in the Zoological Gardens figured; P. L. Sclater, P. Z. S. 1877, p. 679, pl. lxx.

CERCOPITHECIDÆ.

Macacus inuus. No traces of this species occur among the fossil remains from Gibraltar examined by G. Busk; Tr. Z. S. x. pp. 129 & 130.

Macacus nemestrinus. H. C. Chapman describes the placenta; P. Ac. Philad. 1877, pp. 194.

Cynocephalus leucophaeus. On its habits in confinement; J. von Fischer, Zool. Gart. 1877, pp. 73-97. *Cf.* C. Darwin, Nature, xv. p. 18.

GENUS INCERTÆ SEDIS.

Pitheciastes, g. n., (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 219. Type, *P. brevifacies*, sp. n., *id. ibid.*, "Upper Tertiaries" of N. America.

LEMURES.

W. TURNER's important paper "On the Placentation of the Lemurs" [*cf.* Zool. Rec. xiii. *Mamm.* p. 10] is published in full; Phil. Tr. clxvi. pp. 569-587, pls. xlix.-li. Summary of results reprinted; J. Anat. Phys. xii. pp. 147-153.

CHIROMYIDÆ.

Chiromys madagascariensis. A. Milne-Edwards & A. Grandidier describe its nest-building habits; C. R. lxxxiv. pp. 196 & 197.

CHIROPTERA.

G. E. DOBSON describes a collection of Bats from New Britain and the vicinity, containing 12 species, of which four are new [*Pteropodidæ*, *Rhinolophidæ*]; P. Z. S. 1877, pp. 114-123, pl. xvii. He also gives notes on collections from India and Burma; two species [*Vespertilionidæ*] are new; J. A. S. B. xlvi. pt. 2, pp. 310-319.

W. LECHE's "Studier öfver Mjölkdentionon och tändernas homologier hos Chiroptera" [*cf.* Zool. Rec. xiii. *Mamm.* p. 10] are translated; Arch. f. Nat. 1877, pp. 353-364.

A. P. NINNI gives a list of 14 species of Bats observed in Venetia; Atti Soc. Pad. iii. (1874) p. 203.

PTEROPODIDÆ.

Pteropus epularius, sp. n., E. Pierson Ramsay, P. Linn. Soc. N. S. W. ii. p. 8, New Guinea.

Pteropus albo-scapulatus, sp. n., *id.* l. c. p. 17, Duke of York Island; type of *Cheiropteruges*, subg. n.

Cyonycteris brachyotus, sp. n., G. E. Dobson, P. Z. S. 1877, p. 116, New Britain, or vicinity.

Harpyia major, sp. n., *id.* l. c. p. 117, New Britain, or vicinity.

Melonycteris, g. n., *id.* l. c. p. 119; allied to *Macroglossus*, but differing in dentition and attachment of wing-membrane. Type, *M. melanops*, sp. n. (pl. xvii.), New Britain or vicinity.

RHINOLOPHIDÆ.

Phyllorrhina calcarata, sp. n., G. E. Dobson, P. Z. S. 1877, p. 122, New Britain, or vicinity.

VESPERTILIONIDÆ.

Vesperugo nasuatus, sp. n., G. E. Dobson, J. A. S. B. xlvi. pt. 2, 1877, p. 311, Sind; *V. blanfordi*, sp. n., *id.* l. c. p. 312, Tenasserim.

EMBALLONURIDÆ.

Amorphochilus, g. n., W. Peters, MB. Ak. Berl. 1877, p. 185, pl. iv.; allied to *Furia*, but with the muzzle developed into a truncated snout with a raised upper margin. Type, *A. schnabli*, sp. n., *id. l. c.*, Peru.

INSECTIVORA.

H. WINGE reviews the cranial characters of the Moles and Shrews, and arranges the families of Insectivora as follows:—*Galeopithecidae*, *Cladobatidae*, *Macrocelididae*, *Erinaceidae*, *Centetidae* (with *Potomogale*), *Soricidae*, *Talpidae*, *Chrysochloridae*. Vid. Medd. 1877, pp. 115–144.

ERINACEIDÆ.

Erinaceus krugi, sp. n., W. Peters, SB. nat. Fr. 1877, p. 78, West Africa ? (captured alive in Porto Rico).

TALPIDÆ.

↓ E. COUES enumerates the American genera and species; Bull. U. S. Surv. Terr. iii. pp. 632–634.

SORICIDÆ.

J. ANDERSON reviews new or little known Asiatic Shrews in the Indian Museum; J. A. S. B. xlvii. pt. 2, pp. 261–283. He characterizes *Chimarrogale* (p. 262), g. n., allied to *Nectogale*, but with the hind-feet not webbed, type, *Crossopus himalaicus*, Gray; and describes *Crocidura fulvocinerea* (p. 263, Assam), *C. blythi* (p. 264, Assam), *C. sindensis* (p. 266, Sindh), *C. pealana* (p. 267, Assam), *C. blanfordi* (p. 269, Bombay), *C. stoliczkaana* (p. 270, Bombay), *C. macrotis* (p. 271, Tenasserim), *C. nitido-fulva* (p. 272, Bengal), *C. nilgirica* (p. 274, Nilgiris), *C. travancorensis* (p. 275, Travancore), *C. bidiana* (p. 276, Madras), *C. rubicunda* (p. 277, Parionath), *C. subfulva* (p. 278, Khach), *C. pygmaoides* (p. 279, Himalayas), *C. rubricosa* (p. 280, Assam), *C. kingiana* (p. 281, Sikkim), and *Soriculus gracilicauda* (p. 282, Sikkim), spp. nn.

↓ E. COUES has precursory notes on the American species, and describes *Microsorex* (p. 646), Baird MS., subg. n., type, *Sorex hoyi*, Bd.; *Notiosorex* (p. 646), Bd. MS., subg. n., types, *S. crawfordi* (p. 651), sp. n., Bd. MS., Oregon, and *S. evotis* (p. 652), sp. n., Coues; *S. pacificus* (p. 650), sp. n., Bd. MS., Oregon; and *Soriciscus* (p. 649), subg. n., Coues, type, *Blarina mexicana* (p. 652), sp. n., Bd. MS., Mexico. Bull. U. S. Surv. Terr. iii. pp. 634–653.

Sorex vera-pacis, sp. n., E. R. Alston, P. Z. S. 1877, p. 445 [= *Corsira temlyas*, Gray, *sine descr.*], Guatemala.

Crocidura schweitzeri, sp. n., W. Peters, MB. Ak. Berl. 1877, p. 187, Liberia.

Pachyura etrusca found in Piedmont; M. Lessona, Atti Acc. Tor. xii. pp. 495–500.

CARNIVORA.

FELIDÆ.

Felis pardus, *F. pardina*, and *F. caligata* found fossil at Gibraltar; G. Busk, Tr. Z. S. x. pp. 79-88, pl. iii.

Felis tigrina, remarks on its synonymy; D. G. Elliott, P. Z. S. 1877, pp. 704-707.

Felis lanea, sp. n., P. L. Selater, *tom. cit.* p. 532, pl. lv., South Africa.

Pseudaelurus sivalensis, sp. n. (foss.), R. Lydekker, Rec. Geol. Surv. Ind. x. p. 83, Tertiaries of the Siwaliks.

HYÆNIDÆ.

Hyæna crocuta. The fossil Hyæna of Gibraltar identified with this species; G. Busk, Tr. Z. S. x. pp. 75-79, pls. i. & ii. On the female generative organs, in which the urino-genital canal perforates the clitoris; M. Watson, P. Z. S. 1877, pp. 369-379, pls. xl. & xli.

VIVERRIDÆ.

Paradoxurus prehensilis figured from a living specimen in the Zoological Gardens; P. L. Selater, P. Z. S. 1877, p. 481, pl. xxi.

Ichthytherium sivalense, sp. n. (foss.), R. Lydekker, Rec. Geol. Surv. Ind. x. p. 32, Tertiaries of the Siwaliks.

CANIDÆ.

Canis. L. H. Jeitteles believes that the domestic breeds of dogs are derived from *C. aureus*, *C. pallipes*, and *C. lupaster*, and that *C. lupus*, *C. vulpes*, and *C. primævus* have had nothing to do with their ancestry. Die Stammväter u. Hunde-Rassen [*suprà*, p. 4].

R. Garner gives notes on the weight of the brain in various breeds of dogs; Rep. Br. Ass. 1876, pp. 152 & 153.

Canis pictus. On its rudimentary clavicle; R. Hartmann, SB. nat. Fr. 1876, p. 168.

Canis jubatus figured from a living specimen in the London Zoological Gardens; P. L. Selater, P. Z. S. 1877, p. 806, pl. lxxxii.

Vulpes lagopus. On its habits in Grinnell Land; H. W. Feilden, Zool. 1877, pp. 318 & 319.

Vulpes canus, sp. n., W. T. Blanford, J. A. S. B. xlv. pt. 2, p. 321, Baluchistan.

Nyctereutes viverrinus figured; E. v. Martens, Preuss. Exp. Ost-Asien, Zool. i. pl. i.

PROCYONIDÆ.

Bassaricyon. J. A. Allen describes the external characters of this remarkable form [*cf.* Zool. Rec. xiii. *Mamm.* p. 14], which most resemble those of *Nasua*, and figures the type of *B. gabbi*; P. Ac. Philad. 1877, pp. 267 & 268, pl. ii.

MUSTELIDÆ.

↓ E. COUES monographs the North American genera and species. Fur-bearing Animals [*suprà*, p. 3].

↓ *Mustela erminea* found in north-west Greenland; H. W. Feilden, Zool. 1877, p. 317. Notes on this and the next species in Schleswig-Holstein; J. Rohweder, Zool. Gart. 1877, pp. 372-379.

Mustela vulgaris. On its existence in Ireland; R. M. Barrington, Zool. 1877, p. 223; J. Douglas-Ogilby, *ibid.*; J. A. Mahoney, *tom. cit.* p. 290; W. Borrer, *tom. cit.* p. 291; W. Warren, *tom. cit.* p. 379.

Mustela stoliczkaana, sp. n., W. T. Blanford, J. A. S. B. xlvi. pt. 2, p. 260, Yarkand.

Martes. On the occurrence of Martens in Britain; A. P. Morris, Zool. 1877, p. 251; W. A. Durnford, *tom. cit.* p. 292; H. M. Wallis, *ibid.*; T. Southwell, *tom. cit.* p. 338.

↓ *Mephitis*. E. Coues recognizes three species of *Mephitis*, and probably one only of *Conepatus*. Fur-bearing Animals [*suprà*, p. 3], pp. 187-260.

Mephitis mephitis. Notes on "Hydrophobia from Skunk bite" [*cf.* Zool. Rec. xi. p. 9]; E. Coues, *tom. cit.* pp. 223-235. Note on its food; C. Aldrich, Am. Nat. xi. p. 687.

Meles taxus. On its period of gestation; G. B. Corbin, Zool. 1877, p. 251; F. H. Salvin, *ibid.* Notes on its habits; H. Schacht, Zool. Gart. 1877, pp. 302-306.

↓ *Taxidea sulcata*, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 227, Pliocene of Washington territory.

Lutra vulgaris. On its time of breeding; E. H. Rodd, Zool. 1877, p. 17; A. H. Cocks, *tom. cit.* pp. 100 & 101; J. Southwell, *tom. cit.* pp. 172-174.

URSIDÆ.

↓ *Ursus*. G. Busk remarks on the relationship of the fossil and recent species, and on the reported existence of a Bear in North Africa. Tr. Z. S. x. pp. 60-74, pls. iv.-vi.

Ursus arctos and *U. maritimus*. On bastards between these species born in Nill's Menagerie at Stuttgart; P. L. Martin, Zool. Gart. 1876, pp. 20-22; *id. op. cit.* 1877, pp. 135-136; W. Stendell & E. von Martens, *tom. cit.* pp. 401 & 402.

Ursus labiatus. E. Alix describes two pharyngeal pouches placed between the base of the skull and the origin of the œsophagus; Bull. Soc. Zool. 1877, pp. 63 & 64.

Ursus spelæus and *U. arctos*. Note on their specific distinction; R. Hensel, SB. nat. Fr. 1876, pp. 48-50.

↓ *Ursus gedrosianus*, sp. n., W. T. Blanford, J. A. S. B. xlvi. pt. 2, p. 317, Baluchistan. *U. pruinosus*, Blyth, redescribed; *id. l. c.* pp. 318-320.

Hyenarctos. On the occurrence of the remains of a species in the Red Crag of Suffolk; W. H. Flower, J. G. Soc. xxxiii. pp. 534-536.

↓ *Hyenarctos sivalensis*. Note on its dentition; R. Lydekker, Rec. Geol. Surv. Ind. x. p. 33.

- ↓ *Amphicyon palæindicus* (Falconer, MS.), sp. n. (foss.), R. Lydekker, *l. c.* p. 83, and Pal. Ind. Ser. x. 2, p. 66, pl. vii. figs. 5, 8, 12, Tertiaries of the Siwaliks.

OTARIIDÆ.

W. PETERS has brief supplementary notes on this family; he recognizes one species of *Otaria*, four of *Eumetopias*, and eight of *Arctocephalus*. MB. Ak. Berl. 1877, pp. 505-507.

Arctocephalus williamsi, sp. n. (foss.), F. McCoy, Prodr. Palæont. Vict. dec. v. p. 7, pls. xli. & xliv., Pliocene of Victoria.

TRICHECHIDÆ.

- ↓ P. J. VAN BENEDEN describes and illustrates remains of *Trichecus*, *Tricheodon*, and *Alachtherium* [cf. Zool. Rec. xiii. Mamm. p. 13]. Ann. Mus. Belg. i. pp. 39-56, pls. i.-viii.

PHOCIDÆ.

- ↓ P. J. VAN BENEDEN has notes on recent Seals, and describes and illustrates remains of the fossil genera *Mesotaria*, *Palæophoca*, *Platyphoca*, *Cullophoca*, *Platyphoca*, *Gryphoca*, *Phocanella*, *Monatherium*, and *Prophoca* [cf. Zool. Rec. xiii. Mamm. p. 13]. Ann. Mus. Belg. i. pp. 3-36, 56-86, pls. ix.-xviii.

- ↓ *Phoca hispida* was the only Seal observed during Nares's Expedition in the Polar Sea; W. H. Feilden, Zool. 1877, p. 359.

Phoca grænlandica found fossil in Post-pliocene of the Ottawa River; J. Dawson, Canad. Nat. (2) viii. pp. 340 & 341.

Halicherus grypus: notes on its occurrence on the east coast of Scotland; R. Walker, Scott. Nat. iii. pp. 154-160.

CETACEA.

G. CAPELLINI has published a memoir on "Balenottere fossili e Pachycanthus dell' Italia Meridionale," Atti Acc. Rom. (3) i. pp. 611-630, pls. i.-iii., and describes *Heterocetus guiscardii*, sp. n. (foss.), p. 613.

D. CUNNINGHAM gives notes on the spinal nervous system in this order. Rep. Brit. Ass. 1876, pp. 149-151; J. Anat. Phys. xi. pp. 209-228, pl. vii.

J. HECTOR gives "Notes on New Zealand Cetacea," describing and figuring bones of *Tursio metis* and the outline of *Globicephalus macrorrhynchus*. He also figures skulls of *Electra clangula*, *Delphinus forsteri*, *Clymenia novæ-zealandiæ*, and *C. obscura*. Tr. N. Z. Inst. ix. pp. 477-484 pls. xi.-xiii. A.

W. TURNER, in "A further contribution to the Placentation of the Cetacea," describes the gravid uterus of *Monodon monoceros*. P. R. Soc. Edinb. 1876-1877, pp. 103-110.

DELPHINIDÆ.

F. W. HUTTON gives notes on the New Zealand species; Tr. N. Z. Inst. ix. pp. 349 & 350.

Grampus griseus. Notes on a specimen captured at Sidlesham, near Chichester, in July, 1875; H. Lee, P. Z. S. 1877, pp. 808 & 809.

PHYSETERIDÆ.

J. v. HAAST reproduces his descriptions and figures of *Oulodon*, of *Ziphius* [now *Epidon*] *novæ-zealandiæ*, and of *Mesoplodon floweri* [cf. Zool. Rec. xiii. Mamm. p. 15]; Tr. N. Z. Inst. ix. pp. 430-457, pls. xxv. & xxvi.

W. H. FLOWER reviews the existing species of *Mesoplodon*, of which he recognizes seven, including *M. haasti*, sp. n., = *M. hectori*, Hector, nec Gray. The paper will be published in Tr. Z. S.; abstract, P. Z. S. 1877, p. 684.

✓ *Dinoziphius carolinensis* sp. n., (foss.), J. Leidy, J. Ac. Philad. (2) viii. p. 216, pl. xxxiv., Post-pliocene of S. Carolina.

✓ *Chonoziphius trackops* and *C. liops*, spp. nn. (foss.), J. Leidy, P. Ac. Philad. 1876, p. 81, J. Ac. Philad. (2) viii. pp. 218-224, pls. xxx. & xxxi., Post-pliocene of S. Carolina..

✓ *Eboroziphius*, g. n. (foss.), id. P. Ac. Philad. 1876, p. 81, J. Ac. Philad. (2) viii. pp. 224-226, pls. xxx.-xxxi. Type, *E. cælops*, sp. n., *ibid.*, same formation.

Belemnoziphius prorops, sp. n. (foss.), id. P. Ac. Philad. 1876, p. 81, same formation. Removed to genus *Dioplodon*; id. J. Ac. Philad. (2) viii. pp. 266 & 267, pl. xxx.

✓ *Prozoziphius*, g. n. (foss.), id. P. Ac. Philad. 1876, p. 87; *ibid.*, J. Ac. Philad. (2) vii. pp. 227-230, pl. xxxii. Types, *P. macropus* and *P. chonops*, spp. nn., same formation.

BALÆNIDÆ.

✓ *Balæna mysticetus* does not go further north than Robeson's Channel; H. W. Feilden, Zool. 1877, p. 360.

✓ *Balæna biscayensis*. P. Gervais figures the auditory bullæ and cervical vertebrae of this species and of *Macleayius australiensis*; J. Zool. vi. pls. ix.-xi.

Balæna tarentina, sp. n., G. Capellini, C. R. lxxxiv. p. 1043, Mediterranean; id., Mem. Ac. Bologn. (3) vii. [Not seen by the Recorder; cf. A. Doran, Ann. N. H. (4) xx. pp. 328-331; P. Gervais; J. Zool. vi. pp. 170-172, 285-288, pl. viii.]

✓ *Balenoptera*. On the Adriatic Rorqual described by Mondini; G. Capellini, Mem. Ac. Bologn. (3) vii. [Not seen by the Recorder; cf. J. Zool. vi. pp. 167-170.]

Rhachianectes glaucus. P. J. van Beneden sums up what is known of this remarkable form [cf. Zool. Rec. vi. p. 23]; Bull. Ac. Belg. 1877. [Not seen by the Recorder; cf. J. Zool. vi. pp. 83-87].

GENUS INCERTÆ SEDIS.

✓ *Cete[r]rhinops*, g. n. (foss.), J. Leidy, J. Ac. Philad. (2) viii. p. 230, pl. xxxiv.; perhaps a Squalodontoid. Type, *C. longifrons*, sp. n., *id. l. c.*, Post-pliocene of S. Carolina.

SIRENIA.

MANATIDÆ.

Manatus americanus. A. H. Garrod describes the external appearance and soft parts of a female which died at the Zoological Gardens, figuring the lip-pads, brain, and liver; Tr. Z. S. x. pp. 137-145, pls. xxviii.-xxx.

PROBOSCIDEA.

ELEPHANTIDÆ.

57 *Elephas antiquus*. A. Leith Adams minutely describes and figures the dentition and osteology in part i. of his "British Fossil Elephants" [cf. *suprà*, p. 4].

Elephas primigenius. On remains found in Walcheren; J. C. de Man, Arch. Zeeuwsch Genootsch. Wetensch. (Middelburg), 1875, pp. 101-127. [Not seen by the Recorder; cf. Niederl. Arch. Zool. iii. p. 301.]

✓ *Stegodon ganesa*. Further notes [cf. Zool. Rec. xiii. *Mamm.* p. 16]; R. Lydekker, Rec. Geol. Surv. Ind. x. p. 31.

✓ *Mastodon falconeri*, sp. n. (foss.)?, *id. l. c.* p. 83, Tertiaries of the Siwaliks.

Mastodon. M. Vacck describes the remains of five species found in the Tertiary formations of Austria; (abstract) Verh. geol. Reichsanst. 1877, pp. 52 & 53.

✓ *Tetralophodon campester*, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 225, Miocene of Kansas.

DINOTHERIIDÆ.

✓ *Antolotherium*, Falc., is not separable from *Dinotherium*; R. Lydekker, Rec. Geol. Surv. Ind. x. p. 33.

UNGULATA PERISSODACTYLA.

UINTATHERIIDÆ.

Coryphodon. O. C. Marsh gives further characters of this Eocene genus [cf. Zool. Rec. xiii. *Mamm.* 17] which he considers to represent a distinct family of Perissodactyla; he figures the skull and feet. Am. J. Sci. (3) xiv. pp. 81-85, pl. iv.

RHINOCERONTIDÆ.

J. F. BRANDT, in his "Versuch einer Monographie der Tichorhinen Nashörner," fully describes the skeleton of *R. antiquitatis* [= *tichorrhinus*] and *R. mercki*, with observations on other recorded species referable to his "Sub-genus aut genus *Tichorhinus*." Mém. Pétersb. (7) xxiv. art. 4, pp. 135, pls. xi.; abstract, Bull. Pétersb. xxiv. p. 167.

✓ *Rhinoceros*. Fossil remains from Gibraltar, probably identical with *R. hemiteachus*, Falc., described; G. Busk, Tr. Z. S. x. pp. 90-108, pls. x.-xiii.

✓ *Rhinoceros sondaicus*. Notes on its visceral anatomy; A. H. Garrod, P. Z. S. 1877, pp. 707-711. On its *Tania*; id. *tom. cit.* pp. 788 & 789.

Rhinoceros inermis. W. Peters describes Lesson's type in the Berlin Museum, and concludes that the Sunderbund *Rhinoceros* is specifically distinct from the Javan *R. sondaicus*. MB. Ak. Berl. 1877, pp. 68-71, pls. i.-iii.

✓ *Rhinoceros iravadicus* (p. 18, pl. v. figs. 1-3, Ava), and *R. planidens* (p. 23, pl. iv. figs. 7 & 9, Siwaliks), spp. nn. (foss.), R. Lydekker, Pal. Ind. Ser. x. 2.

✓ *Amynodon*, g. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xiv. p. 251, hornless, with four toes before and three behind. Type, *Diceratherium advenum*, Marsh [cf. Zool. Rec. xii. p. 15].

LOPHIODONTIDÆ.

✓ *Lophiodon*. M. Vélain announces the discovery of an enormous number of remains in the Département de l'Aisne; Bull. Soc. Géol. (3) v. pp. 32 & 33.

✓ *Tupiravus*, g. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xiv. p. 252, intermediate between *Lophiodon* and *Tapirus*. Type, *L. validus*, Marsh. Miocene of New Jersey.

EQUIDÆ.

J. C. FORSYTH-MAJOR begins "Beiträge zur Geschichte der fossilen Pferde, insbesondere Italiens," with general remarks on the dentition and especially on the milk-teeth of the various fossil forms. Abh. schw. pal. Ges. iv. art. 4, pp. 1-16, pls. i.-iv.

Equus caballus. J. A. Ryder discusses the "Evolution and Homologies of the Incisors of the Horse," considering that the posterior basal ridges in the foal are homologous with those of *Palæotherium* and *Palæoplotherium*. P. Ac. Philad. 1877, pp. 152-154.

✓ *Sivatherium*, g. n. (foss.), R. Lydekker, Rec. Geol. Surv. x. p. 31, = *Hippotherium*, id. *tom. cit.* p. 82. Type, *S. [H.] theobaldi*, sp. n., p. 31, Tertiaries of the Siwaliks.

UNGULATA ARTIODACTYLA.

ANTHRACOTHERIIDÆ.

✓ *Merycopotamus*. R. Lydekker has a further note on *M. dissimilis*, Rec. Zool. Surv. Ind. x. p. 34; and corrects a misprint, by which he was made to refer the genus to the *Hippopotamidæ* [cf. Zool. Rec. xiii. *Mamm.* p. 18], *tom. cit.* p. 79. He indicates a new allied genus from the Siwaliks, but without naming it, *tom. cit.* p. 78.

✓ *Anthracotheium punjabiense*, sp. n. (foss.), id. *tom. cit.* p. 78, Tertiaries of the Siwaliks.

✓ *Rhagatherium sindiense*, sp. n. (foss.), id. *tom. cit.* p. 225, = *Anthrocotherium silistrense*, Pentl., pt.

✓ *Hyopotamus palæindicus*, sp. n. (foss.), id. *tom. cit.* p. 77, Tertiaries of the Siwaliks.

HIPPOPOTAMIDÆ.

- ✓ *Hippopotamodon*, g. n. (foss.), R. Lydekker, Rec. Geol. Surv. Ind. x. p. 81. Allied to *Hippopotamus*, but differing in dentition. Type, *H. sivalense*, sp. n., *ibid.* Tertiaries of the Siwaliks.

SUIDÆ.

G. ROLLESTON'S paper "On the Domestic Pig in Pre-historic Times" [*cf.* Zool. Rec. xiii. *Mamm.* p. 18] is published in full, Tr. L. S. (2) i. pp. 251-286, pls. xli.-xliii.

A. H. GARROD has a note on a pair of solid-hoofed domestic Pigs from Cuba, in which the distal ends of the ungual phalanges were completely fused. P. Z. S. 1877, p. 33.

Sus leucomystax. Its skull figured; E. v. Martens, Preuss. Exp. Ost-Asien, Zool. i. pl. ii.

✓ *Dicotyles serus*, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 224, Miocene of Kansas.

✓ *Sanitherium schlagintweiti*. Note on its dentition; R. Lydekker, Rec. Geol. Surv. Ind. x. p. 76.

OREODONTIDÆ.

✓ *Brachymeryx*, g. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 220. Type, *B. felicipes*, sp. n., *l. c.*, "Upper Tertiaries" of N. America.

Cyclopidius, g. n. (foss.), E. D. Cope, *tom. cit.* p. 221. Types, *C. simus* and *C. heterodon*, spp. nn., *l. c.*, Miocene of N. America.

CAMELOPARDALIDÆ.

Camelopardalis giraffa. Further note on the great blood-vessels [*cf.* Zool. Rec. xii. p. 18]; H. C. Chapman, P. Ac. Philad. 1877, pp. 37 & 38. Note on the development of the horns; Reichert, SB. nat. Fr. 1877, pp. 203-205.

CERVIDÆ.

Cervus. V. Brooke reviews the Rusine Deer of the Philippines, figures *C. philippinus*, and describes (p. 57) and figures *C. nigricans*, sp. n., P. Z. S. 1877, pp. 51-60, pls. viii.-x.

✓ *Cervus elaphus*, *C. dama*, and perhaps *C. barbarus*, found fossil at Gibraltar; G. Busk, Tr. Z. S. x. pp. 108-115, pls. xix.-xxi.

Cervus dama. L. H. Jeitteles's paper on its distribution [*cf.* Zool. Rec. xi. p. 16] retranslated, and W. Boyd Dawkins's reprinted; Zool. 1877, pp. 81-93.

✓ *Cervus fortis*, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 223, Pliocene of Oregon.

Cervus latidens (p. 47), *C. triplidens* (p. 49), and *C. simplicidens* (p. 51), spp. nn. (foss.), R. Lydekker, Pal. Ind. Ser. x. 2, pl. viii., Siwaliks.

Dorcatherium majus (p. 44) and *D. minus* (p. 46), spp. nn. (foss.), *id. l. c.* pl. vii., Siwaliks.

✓ *Blastomeryx*, g. n. (foss.), E. D. Cope, Rep. Chief Engineers, 1877, p. 350 [not seen by the Recorder]. *B. borealis*, sp. n. (foss.), *id.* P. Am. Phil. Soc. xvii. p. 222, 'Upper Tertiaries' of N. America.

Hydropotes inermis. Remarks on its anatomy; it has little relationship to *Moschus*, and is perhaps most closely allied to the Russine Deer; A. H. Garrod, P. Z. S. 1877, pp. 789-792. Notes on its habits and breeding in confinement; J. M. Cornély, Bull. Soc. Acclim. 1877, pp. 417-427.

Moschus moschiferus. A. H. Garrod describes the visceral anatomy; it has a gall-bladder, and the termination of the urethra is filiform. He considers that it cannot properly be placed among the *Cervide*. P. Z. S. 1877, pp. 287-292.

SIVATHERIIDÆ.

✓ *Vishnuthierium iravadicum* [Zool. Rec. xiii. Mamm. p. 19] more fully described; R. Lydekker, Pal. Ind. Ser. x. 2, pp. 37-39, pl. vii. figs. 1 & 2.

ANTILOCAPRIDÆ.

Antilocapra americana. Note on its habits; S. W. Williston, Am. Nat. xi. pp. 599-603.

BOVIDÆ.

✓ *Antelopinae*. L. Rütimeyer arranges the Antelopes in five groups, of which *Rupicapra*, *Oreotragus*, *Cephalopus*, *Gazella*, and *Strepsiceros*, are the respective types. Abh. schw. pal. Ges. iv. art. 2, pp. 36-72. [Cf. *suprà*, p. 6.]

✓ *Capra ibex* and *C. pyrenaica*. On their specific distinction and on fossil remains of the latter from Gibraltar; G. Busk, Tr. Z. S. x. pp. 115-125, pls. xx.-xxvi.

Ovis aries. Notes on the Merino and "Otter-sheep" [cf. Zool. Rec. x. p. 17]; G. W. Bond, P. Bost. Soc. xviii. pp. 356-358.

✓ *Ovibos moschatus*. Notes on its habits in Grinnell Land; H. W. Feilden, Zool. 1877, pp. 355-358. Remains found in the Valley of the Rhine; F. Roemer, Z. geol. Ges. xxix. pp. 592 & 593.

✓ *Bos acutifrons* and *B. planifrons*, spp. nn. (foss.), R. Lydekker, Rec. Geol. Surv. Ind. x. p. 30, Tertiaries of the Siwaliks.

✓ *Bubalus platyceros*, sp. n. (foss.), *id.* l. c. p. 31, Tertiaries of the Siwaliks.

✓ *Bison americanus*. J. A. Allen monographs the species [*suprà*, p. 1] and illustrates the rapid decrease of its geographical range. Mem. Mus. C. Z. iv. No. 10, pp. 36-236, pls. ix.-xii.; also Mem. Geol. Surv. Kentucky, i. pt. 2; also Rep. U. S. Geol. and Geogr. Surv. of Terr. 1875, pp. 443-587. Additional note on its northern range; *id.* Am. Nat. xi. p. 624. Cf. Zool. Gart. 1877, pp. 363-367.

✓ *Bison latifrons* and *B. antiquus*; on their remains; J. A. Allen, Mem. Mus. C. Z. iv. No. 10, pp. 7-36, pls. i.-viii. Also Mem. Geol. Surv. Kentucky, i. pt. 2.

✓ *Bison ferox* and *B. alleni*, spp. nn. (foss.), O. C. Marsh, Am. J. Sci. (3) xiv. p. 252, Pliocene of Nebraska and Kansas.

CAMELIDÆ.

Camelus dromedarius. W. Turner has notes on the lobules and connective tissue of the liver; J. Anat. Phys. xi. pp. 354-356.

Procamelus occidentalis. E. D. Cope describes a cast of the brain cavity; P. Am. Phil. Soc. xvii. pp. 49-52, pl. i.

GLIRES.

J. A. ALLEN gives a list of described extinct North American Rodents, with references; N. Am. Rod. pp. 943-949 [*suprà*, p. 3].

J. A. RYDER remarks on the difference in form of section of the incisors in this order and in other rodent-like Mammals, concluding that when they are wider than thick the gnawing habit is more feebly developed; J. Ac. Philad. 1877, pp. 314-318.

SCIURIDÆ.

J. A. ALLEN monographs the American species, including the Neotropical and extinct forms; N. Am. Rod. pp. 637-939.

✓ *Sciurus carolinensis*. The central American form is described as var. *yucatanensis*; J. A. Allen, *tom. cit.* p. 705.

Sciurus vulgaris. On its existence in Ireland; J. Douglas-Ogilby, Zool. 1877, p. 223; J. E. Harting, *tom. cit.* p. 224; J. A. Mahoney, *tom. cit.* p. 290.

Sciurus rigidus. On its habits in confinement; J. von Fischer, Zool. Gart. 1877, pp. 21-27.

✓ *Spermophilus xanthoprymnus* (Benn.) redescribed; C. G. Danford and E. R. Alston, P. Z. S. 1877, pp. 277 & 278.

Spermophilus citellus. Notes on its habits; L. Martin, Zool. Gart. 1877, pp. 42-45.

HAPLODONTIDÆ.

✓ E. COUES monographs this family, fully describing (for the first time) its anatomy, and confirming its position among the Sciuromorpha. N. Am. Rod. pp. 549-599, pl. vi.

✓ *Haplodon rufus*. On its habits: E. Coues, *l. c.*; F. S. Matteson, Am. Nat. xi. pp. 434 & 435.

CASTORIDÆ.

J. A. ALLEN monographs the Nearctic recent and fossil forms; he considers the living American Beaver to be a variety of the Palaearctic *Castor fiber*. N. Am. Rod. pp. 431-454.

✓ *Castor fiber* is perhaps not wholly extinct in Jemtland; P. Olsson, Cefv. Ak. Förh. 1876, No. 3, p. 113.

CASTOROIDIDÆ.

J. A. ALLEN separates *Castoroides* as a distinct family under this name removes it from the vicinity of *Castoridæ*, and places it among the Hystrichomorpha. N. Am. Rod. pp. x*, 419-426.

MYOXIDÆ.

Myoxus. J. Jäckel has notes on the German species; Zool. Gart. 1877, pp. 52-58.

✓ *Myoxus dryas*. Note on its variability in colour; C. G. Danford & E. R. Alston, P. Z. S. 1877, pp. 278 & 279.

Eliomys melanurus, figured, with notes on its habits, and on some of the other Rodents of Palestine; H. B. Tristram, P. Z. S. 1877, pp. 40-42, pl. vi.

MURIDÆ.

E. COUES monographs the N. American forms, recognizing the genera *Mus*, *Neotoma*, *Sigmodon*, *Ochedon*, *Hesperomys*, *Arvicola*, *Eutamias*, *Synaptomys*, *Myodes*, *Cuniculus*, and *Fiber*. [Cf. Zool. Rec. xi. p. 18.] N. Am. Rod. pp. 1-246, pls. i.-v.

✓ *Mus rattus*. The "Maori Rat" of New Zealand is referred to this species; F. W. Hutton, Tr. N. Z. Inst. ix. p. 348.

Mus musculus. Notes on "Singing Mice"; H. H. Slater, Nature, xvii. p. 11; J. Sidebotham & G. J. Romanes, *tom. cit.* p. 29.

Mus melleata (= *Golunda melatita*, Gr.) redescribed, with additional note on *G. ellioti* [cf. Zool. Rec. xiii. Mamm. p. 21]; W. T. Blandford, J. A. S. B. xlv. pt. 2, pp. 288-293, pl. i.

✓ *Mus mystacinus*, sp. n., C. G. Danford & E. R. Alston, P. Z. S. 1877, p. 279, pl. xxxi., Asia Minor.

✓ *Mus browni*, sp. n., E. R. Alston, *tom. cit.* p. 123 = *Mus ? echimyoides*, sp. n., E. Pierson Ramsay, Proc. Linn. Soc. N. S. W. ii. p. 15; Duke of York Island. The former name has priority; E. R. Alston, P. Z. S. 1877, p. 743.

✓ *Pogonomys*, subg. n. [of *Mus*], A. Milne-Edwards, C. R. lxxxv. p. 1081. Type, *P. macrurus*, sp. n., *l. c.*, New Guinea.

✓ *Uromys rufescens*, sp. n., E. R. Alston, P. Z. S. 1877, p. 124, pl. xviii. = *Mus musavora* [*musivora*], sp. n., E. Pierson Ramsay, Proc. Linn. Soc. N. S. W. ii. p. 16, Duke of York Island. The former name has priority; E. R. Alston, P. Z. S. 1877, p. 743.

Hesperomys vulpinus and *H. eliurus*. Note on their habits; H. Durnford, *tom. cit.* p. 32.

Myodes lemmus. W. D. Crotch further discusses his theory of its migrations [cf. Zool. Rec. xiii. Mamm. p. 22]; Pop. Sc. Rev. xvi. pp. 143-152, pl. iv. R. Collett reviews and controverts his data; P. L. S. xiii. pp. 327-334.

✓ *Myodes torquatus*. On its habits in Grinnell Land; W. H. Feilden, Zool. 1877, pp. 320 & 321.

GEOMYIDÆ.

E. COUES monographs his families of *Sacomys* and *Geomyidæ* [cf. Zool. Rec. xii. p. 21, xiii. Mamm. p. 22]. N. Am. Rod. pp. 487-542, 607-629, pl. vii.

DIPODIDÆ.

E. COUES monographs his family *Zapodidæ* [*cf.* Zool. Rec. xiii. *Mamm.* p. 22]. N. Am. Rod. pp. 461-479.

HYSTRICIDÆ.

J. A. ALLEN monographs the Nearctic and recent fossil species. N. Am. Rod. pp. 385-398.

CHINCHILLIDÆ.

Lagotomus trichodactylus. Notes on its habits; E. Gibson, P. N. H. Soc. Glasg. iii. pp. 136-140.

CAVIIDÆ.

Hydrochærus capybara. Note on its cœcum [*cf.* Zool. Rec. xiii. *Mamm.* p. 23]; H. C. Chapman, P. Ac. Philad. 1877, p. 146.

LAGOMYIDÆ.

J. A. ALLEN monographs the single Nearctic species *Lagomys princeps*. N. Am. Rod. pp. 405-413.

LEPORIDÆ.

J. A. ALLEN monographs the American Hares, including the Neotropical and fossil forms. N. Am. Rod. pp. 267-379.

> *Lepus graysoni*, sp. n., *id. l. c.* p. 347, Tres Marias Islands and Costa Rica.

> *Lepus brazilianus*. The Central American form described as var. *gabbi*; *id. l. c.* p. 349.

Lepus variabilis. Notes on its change of colour and habits in Livonia; O. von Loewis, Zool. Gart. 1877, pp. 16-20. On its distribution; T. Salvadori, Atti Acc. Tor. xii. pp. 141-150.

> *Lepus glacialis*. On its habits in Grinnell Land; H. W. Feilden, Zool. 1877, pp. 353-355.

Lepus biddulphi, sp. n., W. T. Blanford, J. A. S. B. xlv. pt. 2, p. 324, Gilgit [Cashmere].

Lepus. H. v. Nathusius discusses the evidence as to the alleged crossing of the Hare and Rabbit. Die so-genannt. Leporiden [*cf. suprâ*, p. 6].

GENUS INCERTÆ SEDIS.

> *Allomys*, g. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xiv. p. 253; probably allied to *Pteromys*, but with teeth like those of Ungulates, and representing a distinct family, *Allomyidæ*. Type, *A. nitens*, sp. n., *id. l. c.* Miocene of Oregon.

EDENTATA.

P. GERVAIS, in "Remarques ostéologiques au sujet des Pieds des Édentés," describes the bones of the limbs in the *Bradypodidæ*, *Myrmecophagidæ*, *Dasypodidæ*, *Orycteropodidæ*, *Manidæ*, and *Macrotheriidæ*. J. Zool. vi. pp. 79-82, 198-228, pls. ii.-iv.

✓ P. TAUBER affirms that enamel exists in the teeth of *Tatusia peba*; Nat. Tids. 1876. J. REINHARDT considers the statement premature; Congrès d'hist. Nat. Copenh. 1876 [Not seen by the Recorder]. P. GERVAIS considers that the layer in question is vitro-dentine; J. Zool. vi. pp. 133 & 134.

MANIDÆ.

Manis tricuspis. A live specimen in the Zoological Gardens figured, with notes; P. L. Sclater, P. Z. S. 1877, p. 531.

✓ *Manis sindiensis*, sp. n. (foss.), R. Lydekker, Pal. Ind. Ser. x. 2, i. p. 64, pl. viii. Sind.

ORYCTEROPODIDÆ.

Orycteropus. W. Turner's paper on the placentation is translated, J. Zool. vi. pp. 97-107.

MACROTHERIIDÆ.

✓ *Moropus*, g. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xiv. p. 249, probably allied to *Ancylotherium*, but representing a distinct family, *Moropodidæ*. Types, *M. distans* (p. 249) and *M. senex* (p. 250), Miocene of Oregon, *M. elatus* (p. 250), Pliocene of Nebraska: spp. nn.

GLYPTODONTIDÆ.

J. REINHARDT describes the remains of this family from the Brazilian bone-caves in the Copenhagen Museum, and characterizes *Ocnopus*, g. n. (foss.), type *Megatherium laurillardi*, Lund; Vid. Med. 1875, pp. 165-235, pl. iv.

DIDELPHIA.

MARSUPIALIA.

✓ R. OWEN reprints his papers on fossil Marsupials of Australia and England. Foss. Mamm. Austr. [*suprà*, p. 6].

P. TAUBER considers the molar formula to be $\frac{3}{1} \frac{3}{1}$, instead of $\frac{4}{1} \frac{4}{1}$, as usually stated; Nat. Tids. 1876. [Not seen by the Recorder; cf. J. Zool. vi. p. 46.]

PERAMELIDÆ.

✓ *Peramelas cockerelli*, sp. n., E. Pierson Ramsay, P. Linn. Soc. N. S. W. i. p. 310, New Ireland; further note, *id. tom. cit.* p. 378. *P. macrura*,

var. *torosus* described, *id. op. cit.* ii. p. 12, North Australia; *P. moresbyensis*, sp. n., *id. tom. cit.* p. 14 [New Guinea?]

PHALANGISTIDÆ.

- { *Cuscus vestitus*, sp. n., A. Milne-Edwards, C. R. lxxxv. p. 1080, New Guinea.
Dromicia caudata, sp. n., *id. l. c.* p. 1079, New Guinea.

MACROPODIDÆ.

E. ALIX has notes on the mechanism of mastication in the Kangaroos; Bull. Soc. Z. Fr. ii. pp. 65 & 66.

✓ *Halimaturus browni*, sp. n., E. Pierson Ramsay, P. Linn. Soc. N. S. W. i. p. 307 = *Macropus lugens*, sp. n., E. R. Alston, P. Z. S. 1877, p. 126, pl. xix., New Ireland. The former name has priority; E. R. Alston, *tom. cit.* p. 743.

Pleopus, g. n., R. Owen, Ann. N. H. (4) xx. p. 542, allied to *Hypsi-prymnus*, but with five digits on hind foot. Type, *P. nudicaudatus*, sp. n., *id. l. c.* Australia.

Petrogale assimilis, sp. n., E. Pierson Ramsay, P. Linn. Soc. N. S. W. i. p. 360, North Australia.

Sthenurus minor, sp. n. (foss.), R. Owen, P. Z. S. p. 353, pls. xxxvii. & xxxviii., alluvial deposits of New South Wales. The author discusses the affinities of *Sthenurus*, which he considers quite distinct from *Dorcopsis* [cf. Zool. Rec. xii. p. 24]. *Tom. cit.* pp. 352-361.

ORNITHODELPHIA.

MONOTREMATA.

ORNITHORRHYNCHIDÆ.

Ornithorhynchus anatinus. G. F. Bennett has notes on its burrows and breeding habits, to which R. Owen adds some remarks; P. Z. S. 1877, pp. 161-166. W. W. Spicer records a case in which a wound from the spur of a Platypus was apparently attended by symptoms of poisoning; P. R. Soc. Tasm. 1876, pp. 162-167.

TACHYGLOSSIDÆ.

✓ *Echidna lawesi*, sp. n., E. Pierson Ramsay, P. Linn. Soc. N. S. W. ii. p. 32, pl. i., Southern New Guinea.

Tachyglossus bruijini, sp. n., W. Peters & G. Doria, Ann. Mus. Genov. ix. p. 183 ["Dec., 1876," but ? published before 1878], Northern New Guinea. Skull figured, p. 184. Cf. Nature xv. pp. 257-258 [Jan. 1877]. Made type of *Acanthoglossus*, g. n. [- a, Kraatz, 1858, Coleopt.], P. Gervais, C. R. lxxxv. p. 837 & 990; J. Zool. vi. pp. 375-379; having only three toes with claws on each foot, and the rostrum of the skull being greatly produced and curved.

A V E S.

BY

HOWARD SAUNDERS, F.L.S., F.Z.S., &c.

THE GENERAL SUBJECT, WITH TITLES OF SEPARATE WORKS AND
OF THE MOST IMPORTANT PAPERS PUBLISHED IN
PROCEEDINGS OF SOCIETIES, &c.

ANDERSON, JOHN. On the Osteology and Pterylosis of the Spoon-billed Sandpiper (*Eurynorrhynchus pygmaeus*, Linn.). Tr. L. S. (2) i. pt. iv. p. 213, pl. xxxv.

The result of the examination of the osteological and other characters of *Eurynorrhynchus* shows that it only differs from *Tringa* in the singular expansion of the bill, the structural modification of which is homologous to that in *Platalea leucorodia*. [*Scolopacidae*.]

— On the Habits of Hornbills, being extract of a letter to Dr. J. Murie. J. L. S. xiii. p. 156.

Relates the carnivorous habits of *Hydrocissa albirostris* and *Aceros sub-ruficollis*.

ARLOING, S. Application de la Méthode graphique à l'étude du Mécanisme de la Déglutition chez les Mammifères et les Oiseaux. Ann. Sci. Nat. (6) vi. Art. 1, Oiseaux, pp. 80-92.

AYRES, THOMAS. Additional Notes on the Ornithology of the Republic of Transvaal. Communicated by John Henry Gurney. Ibis, 1877, pp. 339-354.

A supplementary list [*cf.* Zool. Rec. xiii. Aves, p. 2], increasing the number of species obtained from 193-221, with remarks on their habits and the colour of their soft parts, and annotated by Mr. J. H. Gurney, who describes two species as new [*Sylviidae*, *Rallidae*].

BALL, V. Notes on Birds observed in the region between the Mahanadi and Godaveri Rivers. Str. Feath. 1877, pp. 410-420.

BARROWS, W. B. Catalogue of the *Alcidae* contained in the Museum of the Boston Society of Natural History, and a review and proposed Classification of the Family. P. Bost. Soc. xix. pp. 150-165.

BARTLETT, EDWARD. On the affinities of *Mesites*. P. Z. S. 1877, pp. 292 & 293.

Reasons are adduced for considering this genus, hitherto placed amongst the *Turdidae*, to be an aberrant form of the Ardeine group, allied to *Eurypyga* and *Rhinocetus*.

BAU, A., BLASIUS, R., REICHENOW, A., & SCHALOW, H. Zur Vogelkunde Deutschlands, i. Jahresbericht (1876) des Ausschusses für Beobachtungsstationen der Vögel Deutschlands. J. f. O. 1877, pp. 278-342.

A useful compendium, the result of the observations of many ornithologists throughout Germany.

BECCARI, O. [See *Paradiseideu*.]

BENDIRE, O. Notes on some of the Birds found in South-eastern Oregon, particularly in the vicinity of Cape Harney from November, 1874, to January, 1877. P. Bost. Soc. xix. pp. 109-149.

Field-notes on 191 species.

BELL, T. [See NEWTON, A.]

BINGHAM, C. T. Notes on the Nidification of some Birds in Burmah. Str. Feath. 1876, pp. 79-86.

BLANFORD, W. T. Letter on *Caprimulgus unvini* and some *Batrachostomi*. Ibis, 1877, pp. 249-253. [*Caprimulgidae*, *Podargidae*.] See *tom. cit.* p. 388, note.

—. A few Additions to the Sind Avifauna. Str. Feath. 1877, pp. 245 & 246.

The most interesting of the above is *Pyctorrhis altirostris*. [*Timeliidae*.]

—. Notes on some Birds in Mr. Mandelli's Collection from Sikkim, Bhutan, and Tibet. *Tom. cit.* pp. 482-487.

One new species described. [*Podicipidae*.]

BLASIUS, W. Ueber die plattschen Unterscheide der vier Europäischen Weihen-Arten (Gattung *Circus*). J. f. O. 1877, pp. 75-80.

The distinctions between the 4 European species are given, with elaborate tables of wing and other measurements. [*Falconidae*.]

BOCAGE, J. V. BARBOZA DU. Mélanges ornithologiques ii. Observations sur les espèces du genre *Sicobius*. J. Sc. Lisb. xx. [1876] pp. 242-248.

This paper especially refers to one by D. G. Elliott, Ibis, 1876, p. 456, and also contains description of one new species. [*Ploceidae*.]

—. Aves das possessões portuguesas d'Africa occidental. xii. Lista. *Tom. cit.* pp. 248-258.

Remarks on a collection comprising 73 species, many of which had not hitherto been obtained in that part of West Africa. In addition, there is a list of 21 species obtained from the banks of the Quanza, through Mr. R. B. Sharpe.

BOCAGE, J. V. BARBOZA DU. Aves d'Angola encontradas nas collecções do Dr. Welwitsch. *Tom. cit.* pp. 258-263.

Interesting notes on 20 determinable species.

- Aves das possessões portuguezas d'Africa occidental. xiii. Lista. J. Sc. Lisb. xxi. pp. 60-71; *id.* xiv. Lista, *tom. cit.* pp. 142-150; *id.* xv. Lista, *tom. cit.* pp. 151-157.

In the thirteenth list, 51 species are enumerated, and one is described as new [*Capitonidae*]; the fourteenth contains 56 species, and the fifteenth 45 species, 5 of which, being new, are described in the following paper.

- Mélanges ornithologiques. *Tom. cit.* pp. 158-164.

The five new species from Angola, above-mentioned, are here described [*Hirundinidae*, *Muscicapidae*, *Sylviidae*, *Paridae*.]

- Ornithologie d'Angola. 1re Partie. Lisbonne: 1877, Royal 8vo, pp. 256.

The first instalment of a work which is so far a complete summary of the ornithology of Angola, with description of all the species, and details as to their distribution, habits, &c. Most of the novelties have already been recorded, but 3 new species are here described, and 5 figured. [*Cypselidae*, *Laniidae*.]

- Note sur les Races Géographiques ou Espèces des *Bucorax*. Bull. Soc. Z. Fr. ii. pp. 373-376. [*Bucerotidae*.]

BOGDANOW, MODEST. Der Saxaul-Häher, *Podoces panderi*, Fisch. J. f. O. 1877, pp. 81-90. [*Corvidae*.]

- Vorläufige Notiz über die *Calandrella*-Arten der russischen Fauna. *Tom. cit.* pp. 91-96. [*Alaudidae*.]

- Uebersicht der Reisen und naturhistorischen Untersuchungen im Aralo-Kaspi-Gebiet, seit dem Jahre 1720 bis zum Jahre 1874. Russische Revue (St. Petersburg), viii. [1876] pp. 145-159, 440-459, 558-576 [also sep. pp. 51].

An abstract of all the travels and explorations productive of natural history results in the Aral-Caspian district between 1720 and 1874 (but with no special reference to birds).

BOOTH, B. S. On a second discovery of Moa bones at Hamilton. Tr. N. Z. Inst. ix. pp. 365 & 366.

About one-third of the bones belonged to *Cnemidornis*, one-third to adult *Dinornis*, chiefly of the smaller species, the remainder being of young Moas.

BOUVIER, A. Description de trois Oiseaux de la côte occidentale d'Afrique. Bull. Soc. Zool. Fr. i. [1876] pp. 228 & 229.

Two species are described as new, one of which, with a recently described Barbet, are figured. [*Cypselidae*, *Sylviidae*, *Capitonidae*.]

- Faune ornithologique de Kessang (presqu'île de Malacca). Bull. Soc. Zool. Fr. ii. pp. 292-303.

Thirty-one species from the Malay Peninsula are noticed.

- , & SHARPE, R. B. [See SHARPE.]

BRACE, L. J. K. Notes of a few Birds observed at New Providence, Bahamas, not included in Dr. Bryant's List of 1859; with notes by N. B. Moore. P. Bost. Soc. xix. p. 24.

BRANDT, A. Brevis enumeratio operum ad faunam mammalium et avium Imperii Rossici pertinentium. [Sep. pp. 22, from Journ. Imp. Inst. Educ.]

A catalogue of all the works known to the author relating to the Mammals and Birds of Russia.

BROOKS, W. E. A few Observations on some species of *Anthus* and *Budytes*. Ibis, 1877, pp. 206-209.

—. Letter on some *Sylviidae*. Ibis, 1877, pp. 396 & 397.

—. Ornithological Notes. Str. Feath. 1877, pp. 469-472.

On some Birds included in Jerdon's "Birds of India," which the author believes are not good species, with rectifications of synonymy.

BREWER, T. M. [See *Mniotiltidae*.]

BROWN, J. A. HARVIE. On the Distribution of Birds in North Russia.

I. On the Distribution of Birds on the Lower Petchora; Ann. N. H. (4) xix. pp. 277-290. II. Longitudinal Distribution of Species North of 64° 30' N. lat., or the Northern Division; *tom. cit.* pp. 1-30. III. On the Longitudinal Distribution of the Birds of the Southern Division (between 64½° N. and 58°-60° N.), and a Comparison of the Faunas of the two Divisions, with Summaries; *tom. cit.* pp. 180-212. Appendix to above, being Additions to the Data for the Southern Division by Herr Richard Sievers (with summaries up to date); *tom. cit.* pp. 494-499.

—. Letter on B. Radakoff's Hand Atlas of the Breeding Distribution of Birds in European Russia. Ibis, 1877, pp. 255 & 256.

—. On uniformity of method in recording Natural History observations, especially as regards Distribution and Migration. P. N. H. Soc. Glasg. 1876 & 1877, pp. 115-120.

—. Supplementary Notes on the Birds found Breeding in Sutherland. *Op. cit.* 1877, pp. 226-248.

BRÜGGEMANN, F. Beiträge zur Ornithologie von Celebes und Sangir. Abh. Ver. Brem. v. pp. 35-102, pls. iii. & iv.

Principally on a collection made by Dr. G. Fischer in 1873 & 1874, but including some species in the Darmstadt collection obtained by Von Rosenberg. 1 new genus is proposed, and 15 new species are described. [*Falconidae*, *Alcedinidae*, *Cuculidae*, *Pittidae*, *Muscicapidae*, *Artamidae*, *Corvidae*, *Columbidae*, *Rallidae*.] Cf. T. Salvadori, Ibis, 1876, p. 385.

—. Ueber eine Vögelsammlung aus Süd-ost Borneo. *Tom. cit.* pp. 453-464, pl. ix.

Remarks on another and more recent collection by Dr. G. Fischer, from South-eastern Borneo, comprising 93 species, of which 3 are described as new. [*Picidae*, *Muscicapidae*, *Phasianidae*.]

BRÜGGEMANN, F. Nachträgliche Notizen zur Ornithologie von Celebes. *Tom. cit.* pp. 464-466.

Four species are added to the list of Celebes, and 1 to that of Sangir, and 1 new name is conferred. [*Columbidae*; see also *Podargidae*.]

BULLER, W. L. On the Ornithology of New Zealand. *Tr. N. Z. Inst.* ix. pp. 327-337.

The continuation of a previous paper [*Zool. Rec.* xiii. *Aves*, p. 5; see *Spheniscidae*].

— Observations on a species of Shag inhabiting Queen Charlotte Sound. *Tom. cit.* pp. 338-340, pl. xv. figs. 1 & 2.

On a species supposed to be distinct from *Phalacrocorax carunculatus*, with figures of the bills. [For papers on single species see also *Plataleidae*, *Psittacidae*, *Rallidae*.]

BUREAU, L. Note sur les femelles d'*Emberiza cirius*, et de *Passerina melanocephala* à plumage de mâles. *Bull. Soc. Z. Fr.* ii. pp. 23-25. [*Emberizidae*.]

— De la Mue du Bec et des ornements palpébraux du Macareux arctique, *Fratercula arctica*, apres la saison des amours. *Tom. cit.* pp. 377-399.

An important paper, with coloured illustrations of the successive shedding of the horny portions of the bill in this and allied species.

BUTLER, E. A. Notes on the Avifauna of Mount Aboon and North Guzerat. Addenda. *Str. Feath.* 1877, pp. 207-236.

This paper contains the species omitted from two former papers [*Zool. Rec.* xii. & xiii.] with some additional remarks upon those already mentioned, and winds up with a useful table showing the dates from the author's personal observations of arrival and departure of the migratory species. The whole series of papers forms an important addition to our knowledge of the ornithology of that district. This paper is supplemented by the usual editorial comments from Mr. Hume.

— Astola, a Summer Cruise in the Gulf of Oman. *Tom. cit.* pp. 283-303.

A graphic account of a visit to the island of Astola, and of the Sea Birds found breeding there. Some lengthy comments from Mr. Hume are appended. [*Laridae*.]

— Additional Notes on the Birds of Sind. *Str. Feath.* 1877, pp. 322-328.

Mr. Hume, in his accompanying editorial notes, names two species supposed to be distinct. [*Laridae*.]

— Letters on additions to Birds of Kandala and Sind. *Tom. cit.* pp. 503 & 504.

CABANIS, J., & REICHENOW, A. Descriptions of 4 new species of Birds from Loango. *J. f. O.* 1877, p. 103. [*Bucerotidae*, *Alcedinidae*, *Laniidae*, *Pycnonotidae*.]

CAMPBELL, LORD GEORGE. Log-letters from the Challenger. London : 1876.

Contains some interesting, although unscientific, notes on many species of Birds observed, especially upon the Penguins, and other Sea Birds.

CASTELLARNAU, J. M. DE. Estudio Ornitologico del real sitio de San Ildefonso, y de sus alrededores. An. Soc. Esp. 1877, pp. 155-210.

A useful catalogue, with notes, on the Birds found on the northern slope of the Sierra de Guadarrama [an important natural boundary in Spain]. [This paper is omitted in the index.]

CATON, J. D. The Wild Turkey and its Domestication. Am. Nat. xi, pp. 321-330.

COOPER, J. G. On 75 doubtful West Coast [North Am.] Birds. Bull. Nutt. Orn. Club, ii, pp. 88-97.

—. New Facts relating to Californian Ornithology. No. 1. P. Cal. Ac. vi. [1876] pp. 189-202.

COUCH, JONATHAN, the late. A Cornish Fauna, *Aves*, revised and corrected by E. H. Rodd. J. Inst. Cornw. 1877, pp. 404-424.

COUES, E. [See MCCAULEY, C. A. H.]

COLLETT, R. Mindre Meddelelser vedrørende Norges Fuglefauna i Aarene 1873-1876. N. Mag. Naturv. 1877, pp. 85-225.

Notes on the Birds of Norway.

—. Om et Par for Norges Fauna nye Fulgearter. Förh. Selsk. Chr. 1877, No. 5, pp. 1-4.

Records the occurrence of 2 species new to Norway. [*Motacillidæ*, *Sylviidæ*.]

—. Om et Par Fugle-samlinger fra Madagascar-Regionen, modtagne fra Aug. Lantz i 1867, og Missionslæge Borchgrevink i 1875. *Tom. cit.* No. 6, pp. 1-17.

Remarks on 2 small collections, consisting of 59 species.

D'ALBERTIS, ENRICO. Crociera del "Violante." i. Parte Narrativa. Ann. Mus. Genov. xi, pp. 11-272 [1877].

Some remarks on the Birds obtained and observed during a cruise between Genoa and Constantinople are to be found scattered through these pages.

—, M. L. Notes on some Birds collected during the Exploration of the Fly River. Ibis, 1877, pp. 363-372. Reprinted from the "Sydney Mail," of Feb. 24th, 1877.

Interesting remarks upon the species observed, one of which is apparently new [*Sturnidæ*], and upon the strong evidence of a union in recent times between Australia, the Aru Islands, and New Guinea.

—. [See also SALVADORI, T.]

DANFORD, C. G. A Contribution to the Ornithology of Asia Minor. *Ibis*, 1877, pp. 261-274.

This first portion gives a general description of the author's journey, principally amongst the Cilician Mountains, with interesting notes upon the geographical features of the country, and the species of Birds observed, a complete list of which, 185 in number, will appear in subsequent issues. The principal prize was *Tetrogallus caspius*.

DAVID, A., & OUSTALET, E. Les Oiseaux de la Chine: i. pp. 573; ii. Atlas de 124 planches. Paris: 1877.

A valuable illustrated compendium of Chinese Ornithology, containing the principal synonymy, brief description, and remarks upon 807 species, of which 6 are here for the first time described as new, and 3 new genera are erected, whilst those which had recently been described in the Abbé David's "Troisième Voyage" are now more fully noticed. [*Timeliidæ*, *Troglodytidæ*, *Sylviidæ*, *Motacillidæ*, *Fringillidæ*.]

DAVISON, W. Notes on the Nidification of some Burmese Birds. *Str. Feath.* 1877, pp. 453-460.

[See also BINGHAM, C. T., & OATES, E. W.]

DRESSER, H. E. A History of the Birds of Europe, including all the species inhabiting the Western Palearctic Region. Parts lvii.-lxiv.

Eight parts are issued under date of 1877. [*Strigidæ*, *Cuculidæ*, *Caprimulgidæ*, *Turdidæ*, *Sylviidæ*, *Motacillidæ*, *Fringillidæ*, *Perdicidæ*, *Rallidæ*, *Charadriidæ*, *Scolopacidæ*, *Laridæ*, *Procellariidæ*, *Anatidæ*, *Alcidæ*.]

DRUMMOND-HAY, H. M. On Migration. *Scot. Nat.* iv. pp. 85-99, 133-144.

DURNFORD, H. Notes on some Birds observed in the Chuput Valley, Patagonia, and in the neighbouring district. *Ibis*, 1877, pp. 27-46.

Field notes on species observed; some interesting remarks on the nidification of *Synallaxis*. [*Dendrocolaptidæ*.]

— Notes on the Birds of the Province of Buenos Ayres. *Ibis*, 1877, pp. 166-203.

Observations on 144 species, 1 new [*Rallidæ*] principally from the neighbourhood of Baradero on the Paraná.

ERNST, A. Estudios sobre la Flora y Fauna de Venezuela. Carácas, 1877, 4to.

This work, pp. 293-316, contains a Catalogue of the Birds of Venezuela compiled principally from Sclater & Salvin's papers, a total of 556 species being the result.

ELLIOT, D. G. A Monograph of the *Bucerotidæ*, or Family of the Horn bills. Pts. 1-4, 1877, small folio, published by the author.

This is another of the author's handsome Monographs, with well-executed coloured illustrations.

- ELLIOTT, D. G. Review of the *Ibidinæ*, or Sub-Family of the Ibises. P. Z. S. 1877, pp. 477-510.

The literature of this sub-family is given, with its classification, genera, and geographical distribution, and the synonymy of the 25 species which are comprised in it. Three new genera are instituted and described. [*Ibididæ*.]

- Review of the Specimens of *Trochilidæ* in the Paris Museum brought by D'Orbigny from South America. Ibis, 1877, pp. 131-142.

A critical examination of the Humming Birds still existing in the Paris Museum, mentioned by D'Orbigny and Lafresnaye in their 'Synopsis Avium.'

- [For single species, see *Sturnida*, *Bucerotida*, *Trochilidæ*, *Phasiinidæ*.]

FAIRBANK, S. B. A List of Birds collected and observed on the Palani Hills. Str. Feath. 1877, pp. 387-410.

Remarks on 134 species, amongst which are some rarities [*Sylviidæ*, *Timeliidæ*].

FALKENSTEIN, DR. [See REICHENOW, A.]

FEILDEN, H. W. On the Birds of the North Polar Basin. P. Z. S. 1877, pp. 28-32.

16 species observed are enumerated.

- List of Birds observed in Smith Sound and in the Polar Basin during the Arctic Expedition of 1875-76. Ibis 1877, pp. 401-412.

Twenty-four species of Birds are enumerated as having been obtained in Smith Sound and northward between 78° and 83° N. lat., all of them being well-known Arctic forms, but the writer obtained for the first time the nestlings of *Tringa canutus*, and also thoroughly authenticated eggs of *Calidris arenaria* [*Scolopaciidæ*, *Charadriidæ*].

FINSCH, O. Mein dritter Beitrag zur Vögelkunde Grönlands. Abh. Ver. Brem. v. pp. 543-366.

A description, with valuable remarks, of a collection consisting of 32 species, formed by M. Starick in the neighbourhood of Lichtenfels, Greenland. [Cf. Zool. Rec. xi. p. 32.]

- Ornithological Letters from the Bremen Expedition to Western Siberia. Ibis, 1877, pp. 48-66.

Notes on the species observed between Omsk and the Ala-tau range, on the Irtysh, in the Altai, and along the Ob. [For the most interesting, see *Sylviidæ* and *Scolopaciidæ*.]

- On a small Collection of Birds from the Marquesas Islands. P. Z. S. 1877, pp. 407-410.

Six species are enumerated, one new [*Alcedinidæ*].

- Reports on the Collection of Birds made during the voyage of H.M.S. "Challenger." No. IV. On the Birds of Tongatabu, the Fiji Islands, Api (New Hebrides), and Tahiti. *Tom. cit.* pp. 723-742.

FINSCH, O. On a Collection of Birds from Eua, Friendly Islands.
Tom. cit. pp. 770-777.

Twenty-four species are enumerated, one of which seems to be peculiar to the island [*Psittacidae*].

— On the Birds of the Island of Ponapé, Eastern Carolines. *Tom. cit.* pp. 777-782.

Twenty-nine species are noticed, of which seven are peculiar to the island, and one appears to be new [*Columbidae*].

— On a Collection of Birds from Niuafoou Island, in the Pacific.
Tom. cit. pp. 782-787.

A notice of 20 species, only one of which is peculiar to this island [*Megapodidae*].

— Westsibirische Forschungsreise 1876 unter Führung von Dr. O. Finsch. Catalog der Ausstellung ethnographischer und naturwissenschaftlicher Sammlungen. Mit erläuternden Bemerkungen von Dr. O. Finsch. Bremen: 1877, 8vo, pp. 42.

In this Catalogue is a classified List (pp. 26-30) of the Birds observed on the Expedition to Western Siberia, arranged to show the nature of the country they inhabit.

FISCHER, G. A. Briefliche Reiseberichte aus Ost-Afrika. J. f. O. 1877, pp. 171-181, 205-208, 423-426.

FORBES, W. A. Recent Observations on the Parrots of the genus *Eclectus*. Ibis, 1877, pp. 274-283.

Discusses Dr. A. B. Meyer's observations as to the difference in the coloration of the sexes in this genus, and gives a table of the specific differences and the habitat of the 5 species known. [*Cf. Salvadori.*]

— On the *Bursa fabricii* in Birds. P. Z. S. 1877, pp. 304-318.

The author, after a summary of the previous literature of the subject, gives an account of his own observations on the structure of this organ in 90 species of birds of all orders. Woodcuts are given of the arrangement in several forms, and particular attention called to the differences obtaining in the structure of the cloaca of the Struthionous birds.

GADOW, H. Anatomische Beschreibung der Hockhühner (*Cracidae*, Vig.). J. f. O. 1877, pp. 181-190.

— Anatomie des *Phanicopterus roseus*, Pall., und seine Stellung im System. J. f. O. 1877, pp. 382-396, pl. vi.

Illustrations are given of the convolutions of the intestines in the above species, in *Platalea leucorodia*, and in *Anas clangula*; the general result of the author's researches being to show the affinity of *Phanicopterus* with the *Ciconiidae*, and to remove it from the order *Anseres*.

GAMMIS, J. A. Occasional Notes from Sikhim, No. 1. Str. Feath. 1877, pp. 380-387.

Introductory remarks upon the author's collecting-ground, and the more prominent features of its bird-life.

GARROD, A. H. Notes on the Anatomy and Systematic Position of the genera *Thinocorus* and *Attagis*. P. Z. S. 1877, pp. 413-418.

Dissections of specimens of *Thinocorus rumicivorus* and *Attagis gayi* seem to show that there is no intimate relation between them and *Turnia*; the vomer of *Attagis* is described, and some interesting observations are also made upon the systematic position of *Chionis*.

— Notes on the Anatomy of Passerine Birds. Parts ii. & iii. *Tom. cit.* pp. 447-452, 523-526, pl. liii.

The exceptional arrangement of the plantar tendons of the *Eurylæmidae* is described, as is the vomer in the family. Attention is drawn to more than one osteological character of the non-Oscine Passeres, and the previously unknown lower larynx in the *Pteroptoclidæ* (*Grallaria* and others), is figured.

— Notes on an Anatomical Peculiarity in certain Storks. *Tom. cit.* pp. 711 & 712.

A list is given of the species as yet dissected by the author, who found the ambiens muscle present in all except *Abdimia sphenorrhyncha* and *Xenorrhynchus senegalensis*.

— Note on the Absence or Presence of a Gall-bladder in the family of the Parrots. *Tom. cit.* p. 793.

Corrects a statement in P. Z. S. 1874, p. 594, as to the absence of the gall-bladder in all members of the family *Psittaci*, it having since been found to exist in members of the genera *Cacatua* and *Calopsitta*, although absent in all other genera as yet examined.

GERRE, Z. Sur les Plumes du Vol et leur Mue. Bull. Soc. Z. Fr. ii. (1877), pp. 289-290.

GIEBEL, C. G. Thesaurus Ornithologiæ iii. 6te. Halb-band 1877.

This concludes the work [*cf.* Zool. Rec. xii. p. 33, and xiii. *Aves*, p. 12].

GODWIN-AUSTEN, H. H. Descriptions of supposed New Birds from the Naga Hills and Eastern Assam. Ann. N. H. (4) xx. pp. 519 & 520 [*Timeliidæ*, *Paridæ*].

— Fifth List of Birds from the Hill Ranges of the North-East Frontier of India. J. A. S. B. xlv. pt. 2, pp. 191-204, pls. v. vi. & ix.

The new species in the joint paper by the author and Lord Tweeddale (then Lord Walden) in *Ibis*, 1875, are redescribed, and 2 species are now described for the first time [*Timeliidæ*], whilst 3 others are figured [*Timeliidæ*, *Sturnidæ*].

— Description of three new Species of Birds, of the genera *Pellorneum*, *Actinura*, and *Pomatorrhinus*; lately collected in the neighbourhood of Saddy, Assam, by Mr. M. J. Ogle, of the Topographical Survey. *Op. cit.* xlv. pp. 41-44 [*Timeliidæ*, *Pycnonotidæ*].

— Some notes on Birds of the genera *Pellorneum* and *Pomatorrhinus*, with a description of a variety of *Chleuasicus ruficeps*, Blyth. P. A. S. B. 1877, pp. 146-148.

The author's examination of *Pellorneum tickelli*, Blyth, leads him to

refer it to the genus *Alcippe* [*Timeliidæ*]. For others, see *Pycnonotidæ* and *Paridæ*.

GOULD, J. The Birds of Asia. Parts xxix. & xxx., April 1 and Oct. 1, 1877. [*Fringillidæ*, *Pittidæ*, *Sturnidæ*, *Alcedinidæ*, *Paridæ*, *Cuculidæ*, *Phasianidæ*, *Picidæ*, *Eurylemidæ*, *Oriolidæ*, *Dicaeidæ*.]

——. The Birds of New Guinea and the adjacent Papuan Islands, including any new species that may be discovered in Australia. Parts iv. & v., Jan. 1 and June 1, 1877. [*Pittidæ*, *Paradisæidæ*, *Meliphagidæ*, *Muscicapidæ*, *Psittacidæ*, *Sylviidæ*, *Paridæ*, *Casuariidæ*, *Cuculidæ*.]

GURNEY, J. H. Notes on a 'Catalogue of the Accipitres in the British Museum,' by R. Bowdler Sharpe (1874). *Ibis*, 1877, pp. 209–236, 325–336, 418–437. *Falconidæ*. [*Cf.* Zool. Rec. xii. p. 34, & xiii. *Aves*, p. 13.]

——. Letter on a Falcon taken off Socotra, and living in the Zoological Society's Gardens. *Tom. cit.* pp. 397 & 398. [See *tom. cit.* p. 149.]

[This Falcon has since proved to be *F. peregrinus*, see *op. cit.* 1878, p. 380.]

——. [See AYRES, THOMAS.]

——, J. H., JUN. Letter on the Trachea of some *Anatidæ*. *Tom. cit.* pp. 395 & 396.

—— —. Notes on the Fern Islands and some of the Birds which are found there. P. N. H. Soc. Glasg. 1877, pp. 268–278.

HANF, P. B. Der Vogelzug am Furtteiche bei Mariahof in Oberstiermark im Jahre 1876. Verh. z.-b. Wien, xxvii. pp. 235–240.

HARTLAUB, G. Die Vogel Madagascars und der Mascarenen, ein Beitrag zur Zoologie der äthiopischen Region. Halle, 1877, 8vo.

Points out the numerous strong points of affinity with the Indian Avifauna, and the absence, on the other hand, of the characteristic African forms.

——. General Remarks on the Avifauna of Madagascar and the Mascarene Islands. *Ibis*, 1877, pp. 334–336.

An abstract from the introduction to the above work.

HEUGLIN, M. T. V. Reise in Nordost Afrika. Schilderungen aus dem Gebiete der Beni-Amer und Habab, mit zoologischen Skizzen und einem Führer für Jagdreisende. Braunschweig, 1877, 2 vols. 8vo.

The first volume contains a narrative of the late author's expedition along the mountainous district bordering the Red Sea between Suakim and Massouah, with a map. In the second volume 416 species of birds are enumerated, and 2 species are figured [*Sylviidæ*, *Muscicapidæ*].

HOMeyer, E. F. v. Bemerkungen zur Ornis Bulgariens mit Rücksicht auf der Bericht der Gebrüder Sintonis und die Reise-ergebnisse von Dr. Finsch in J. f. O. 1859, p. 378. J. f. O. 1877, pp. 69–74.

HOMÉYER, E. F. v. Deutschlands Säugethiere und Vögel, ihr Nutzen und Schaden. Zool. Gart. 1876, pp. 355-366, 393-402, 435-446.

——. Nutzen und Schaden der wichtigsten Sump- und Schwimm-vögel. *Op. cit.* 1877, pp. 203-208.

Notes on the good and harm of certain birds.

HIGGINS, H. H. Notes by a Field-Naturalist in the Western Tropics. Liverpool : 1877, 8vo, pp. 205.

An interesting account of a visit to the West Indies in the yacht "Argo," with many notices of birds.

HUME, A. O. A First List of the Birds of North-Eastern Cachar. Str. Feath. 1877, pp. 1-47.

A report on a collection, consisting of 157 species, obtained by Mr. James Inglis, whose field-notes add greatly to the value of the paper. 4 supposed new species are described [*Falconidae*, *Pycnonotidae*, *Ploceidae*].

——. Novelties. *Tom. cit.* p. 51 [*Nectariniidae*].

——. Notes. *Tom. cit.* pp. 59-63, 117-140, 347-351, 495-504.

The families and subjects alluded to in the above pages are too numerous to mention.

——. Novelties? *Tom. cit.* pp. 100-117, 13 species; pp. 334-339, 4 species; pp. 487-491, 4 species—total, 21 species—are described as new, or have new names proposed for them [*Paridae*, *Muscicapidae*, *Laniidae*, *Captonidae*, *Turdidae*].

——. Notes on Nomenclature. I., *Tom. cit.* pp. 237-239; II., pp. 275-280.

——. [For papers on single genera or species, see also under *Certhiidae*, *Muscicapidae*, *Campephagidae*, *Sylviidae*, *Hirundinidae*, *Pelecanidae*, *Timeliidae*].

HUTTON, F. W. Remarks on Dr. von Haast's Classification of the Moas. Tr. N. Z. Inst. ix. pp. 363-365.

A criticism of Dr. Haast's paper in Tr. N. Z. Inst. vi. p. 426.

KRIEGER, O. VON. Ueber den Herbstzug der Raubvögel und über das Vorkommen solcher Arten welche in der Unterherrschaft des Fürstenthums Schwarzburg-Sondershausen seit einer Reihe von Jahren beobachtet oder erlegt worden sind. Zool. Gart. 1877, pp. 34-41, 119-131, 183-194.

Treats of the migration of the *Falconidae*.

KUTTER, DR. Betrachtungen über Systematik und Oologie vom Standpunkte der Selectionstheorie. J. f. O. 1877, pp. 396-423.

LANDBECK, O. L. Bemerkungen über die Singvögel Chile's. Zool. Gart. 1877, pp. 233-262.

The author includes every bird, the note of which can by courtesy be called a song, and with the help of members of the *Picidae* and *Trochilidae*, besides those of the great order *Passeres*, he makes a tolerably extensive list.

LANDBECK, C. L. Einige Bemerkungen über den Condor. *Tom. cit.* pp. 296-298.

——. Jagd, Vogelfang und Vogelhandel in Chile. *Tom. cit.* pp. 370-372.

LAWRENCE, G. N. Description of New species of Birds from the Island of Dominica. *Ann. N. Y. Ac. Sci.* i. pp. 46-49.

Three apparently new species are described [*Troglodytidae*, *Mniotiltidae*, *Tyrannidae*].

——. Descriptions of New Species of Birds of the families *Trochilidae* and *Tetraonidae*. *Tom. cit.* i. pp. 50-52.

Three species are described.

——. A Provisional List of the Birds preserved and noticed by Mr. Fred. A. Ober in the island of Dominica. "Forest and Stream," New York, Dec. 6th, 1877.

Fifty-six species are enumerated in this list, which is preliminary to a complete catalogue.

LANGDON, FRANK W. A Catalogue of the Birds in the vicinity of Cincinnati, with Notes. Salem, Mass.: 1877, 8vo, pp. 18.

LATARD, E. L. The Birds of South Africa. New edition, thoroughly revised and augmented by R. BOWDLER SHARPE. London: Pt. iv., April, 1877.

This part contains the remainder of the *Turdidae* (including the *Sylviidae*), the *Nectariniidae*, *Paridae*, and part of the *Muscicapidae*. One species is figured (*Turdidae*).

——. Remarks on the exact localities of some Birds from the Islands of the South Pacific. *P. Z. S.* 1877, pp. 464-465.

Corrects some errors of detail in Dr. Finsch's remarks on geographical distribution [see *P. Z. S.* 1874, p. 94].

——. On two African Cuckoos of the genus *Coccystes*. *Tom. cit.* p. 465.

—— & E. L. C. Notes on the Avifauna of New Caledonia. *Ibis*, 1877, pp. 355-363.

Field notes, supplemented by a list, extracted from *Act. Soc. L. Bord.* xxvii., entitled 'Mélanges Ornithologiques sur la Faune de la Nouvelle Calédonie et description d'une espèce nouvelle,' by M. Mario. Some interesting articles by the above authors are also to be found in "The Field" newspaper.

LENZ, H. Mittheilungen über malayische Vögel. *J. f. O.* 1877, pp. 359-382.

A report on a collection containing 80 species, obtained in North Celebes, Amboina, Ceram, and Bouru.

MCCAULEY, C. A. H. Notes on the Ornithology about the source of the Red River of Texas, from observations made during the exploration conducted by Lieut. E. H. Ruffner; annotated by Dr. Elliot Cones. *Bull. U. S. Geol. and Geogr. Surv.* iii. pp. 655-695.

Relates to the ornithology of the flat treeless waste, 4000 feet above the

level of the sea, known as the Llano-estacado, and is principally valuable as adding to the knowledge of geographical distribution over a little-known district, the species enumerated being neither numerous nor specially interesting.

M'VEAN, COLIN A. Notes on the Ornithology of Yedo. R. Phys. Soc. Edinb. 1877. [Only a separate copy seen by the Recorder.]

MALM, A. W. Göteborgs och Bohusläns Fauna, Rygggradsjuren. Göteborg: 1877, 8vo. [*Aves*] pp. 60-90, & 171-364.

The author notices 292 species of birds occurring in the Swedish provinces of Göteborg and Bohuslän. The principal feature is the plan adopted by the author of renaming a species such as *Turdus merula*, "*Merula linnei*," in every case where the specific name employed by Linnæus has subsequently been used as generic one. The work is also disfigured by some mistakes in the spelling of the scientific names. [The Recorder has not attempted to chronicle these arbitrary alterations, as to do so, would involve a revision of a great portion of the European list.]

MARCHAND, A. Poussins des Oiseaux d'Europe. R. Z. (3) v. pp. 354-358. [*Perdidae*, *Laridae*, *Anatidae*, *Plataleidae*, *Falconidae*, *Gruide*, *Phenicopteridae*.]

MARSH, O. C. Characters of the *Odontornithes*, with notice of a new allied Genus. Am. J. Sci. (3) xiv. pp. 85-87, pl. v.

MARSHALL, G. F. L. Birds'-Nesting in India. A Calendar of the Breeding Seasons, and a popular Guide to the Habits and Haunts of Birds. Calcutta: 1877, crown 8vo, pp. 184, illustrated.

MARTENS, E. VON. Die Preussische Expedition nach Ost-Asien. Zoologischer Theil. i. pp. 412, pl. xv. Berlin: 1876, 8vo.

This account of the exploring expedition of the "Thetis" contains numerous allusions to the birds observed in the course of the voyage, the principal and most compendious observations being at pp. 87-109, on the birds of Japan; pp. 187-193, on those of the Philippines; pp. 215-217, on the birds of Siam; and pp. 261-277, on the birds of the Indian Archipelago. Some copies of Japanese drawings are given, and one species is figured [*Procellariidae*].

MERRIAM, C. H. Review of the Birds of Connecticut, with remarks on their habits. Tr. Conn. Ac. iv. pp. 1-151.

The author enumerates 292 species, respecting which he gives many interesting details, the result of much research. The general tendency of his observations is to show that, although essentially Alleghanian, the Avifauna of Connecticut is considerably tinged by the admixture of Carolinian forms.

MEYER, A. B. Some additional proof, if needed, of the fact that the Red *Electi* are the females of the Green ones. P. Z. S. 1877, pp. 800-803, pl. lxxix. [*Psittaci*].

MINOT, H. D. The Land Birds and Game Birds of New England, with descriptions of the Birds, their Nests and Eggs, their Habits, and Notes. Salem and Boston : 1877, 8vo, pp. 456.

——. Letter, with additions to above. Am. Nat. xi. p. 175.

MIVART, ST. G. On the Axial Skeleton of the *Struthionidæ*. Tr. Z. S. x. pp. 1-52 (with woodcuts).

This is the first of a series of papers instituting comparisons between the axial skeletons of *Struthio camelus*, and those of *Rhea*, *Dromæus*, *Casuarus*, *Apteryx*, and *Dinornis*.

MULSANT, É., & VERREAUX, É. Histoire Naturelle des Oiseaux-Mouches ou Colibris, iii. Liv. 3 & 4, iv. Liv. 1 & 2. [See Zool. Rec. xiii. Aves, p. 19.]

Eight new genera are created in these four parts [*Trochilidæ*].

MÜLLENDORFF, O. F. VON. The Vertebrata of the Province of Chihli, with notes on Chinese Zoological Nomenclature. J. N. China Soc. (n.s.) xi. pp. 41-111. (Birds, pp. 76-102.)

A most interesting account of the Chinese names for, and traditions respecting, the birds of the country.

NELSON, E. W. Birds of North-Eastern Illinois. Bull. Essex Inst. viii. pp. 90-155.

Valuable and succinct field-notes from the previously unworked region bordering on Lake Michigan.

——. Notes upon Birds observed in Southern Illinois between July 17th and Sept. 4th, 1875. *Tom. cit.* ix. pp. 32-65.

NEWTON, ALFRED. On the Nomenclature of the groups of *Ratitæ*. Ann. N. H. (4) xx. p. 499.

The author suggests the following names for the component parts of the Sub-class *Ratitæ*, based upon the characters assigned by Huxley:—

Order I. STRUTHIONES	Fam. <i>Struthionidæ</i> .
„ II. RHÆ	Fam. <i>Rheidæ</i> .
„ III. MEGISTANES	Fam. i. <i>Dromæidæ</i> ; Fam. ii. <i>Casuariidæ</i> .
„ IV. IMMANES	Fam. i. <i>Dinornithidæ</i> ; Fam. ii. <i>Palapterygidæ</i> .
„ V. APTERYGES	Fam. <i>Apterygidæ</i> .
„ VI. ÆPYORNITHES	Fam. <i>Æpyornithidæ</i> .

——. A History of British Birds, by the late William Yarrell. 4th Edition. Part xi. London : 1877, 8vo.

This number concludes the *Fringillidæ*, and describes the *Icteridæ* and *Sturnidæ*.

——. The "Encyclopædia Britannica," 9th Edition, contains the following articles by this author [*cf.* Zool. Rec. 1875, p. 43]: Vol. iv. (1876), *Bunting*, *Bustard*; Vol. v. (1876), *Caperally*; Vol. vi. (1877), *Coot*, *Cormorant*, *Crane*, *Crossbill*, *Crow*, *Cuckow*, *Curlew*; Vol. vii., *Dodo*, *Dove*, *Duck*, *Eagle*, *Eider*.

NEWTON, ALFRED. *The Natural History and Antiquities of Selborne*, by the late Gilbert White; edited by Thomas Bell. 2 vols, royal 8vo. London: 1877.

The natural history notes by A. Newton bear his initials.

NEWTON, EDWARD. *On a Collection of Birds from the Island of Anjuan*. P. Z. S. 1877, pp. 295-302, pls. xxxiii. & xxxiv.

Twenty-seven species are noticed, 8 of which are new to the fauna, and 5 of them undescribed, the most interesting of the latter being a true *Turdus*, a genus not previously known to exist in the Mascarene Islands or in Madagascar [*Dicaeidae*, *Muscicapidae*, *Turdidae*, *Columbidae*].

OATES, E. W. *Notes on the Nidification of some Burmese Birds*. Str. Feath. 1876, pp. 141-170.

Contains information as to the breeding of 96 species, with many important details not yet recorded in Mr. Hume's "Nests and Eggs."

——. *Notes on some Burmese Birds*. *Tom. cit.* pp. 247-254.

Five species are enumerated, none of which are new, but two are rare.

OUSTALET, E. *Description de quelques espèces nouvelles de la collection ornithologiques du Museum d'histoire naturelle*. Bull. Soc. Philom. Paris (7), i. pp. 98-107.

Remarks on several recently received collections from the Sandwich and the Seychelle Islands and South Africa. Descriptions of 1 new genus and 2 species [*Fringillidae*, *Sylviidae*], and 1 sub-species [*Glareolidae*].

——. [For single species, see also *Timeliidae*, *Ibididae*.]

OWEN, RICHARD. *On Dinornis* (Part xxi.), containing a restoration of the skeleton of *Dinornis maximus*, Owen; with an Appendix on Additional Evidence of the genus *Dromornis* in Australia. Tr. Z. S. x, pp. 147-188, pls. xxxi.-xxxiii.

PARKER, W. K. *On the Structure and Development of the Bird's Skull*. Tr. L. S. (2) i. pt. iii. pp. 99-154, pls. xx.-xxvii.

An important paper, illustrative of the variations in formation in the principal groups, with plates, principally of the palatal bones.

PASCOE, F. P. *Zoological Classification*, a handy book of reference, with tables of the sub-kingdoms, classes, orders, &c., of the animal kingdom. London: 1877, sm. 8vo. *Aves*, pp. 149-166.

PAVESI, P. *Sulla prima e recentissima comparsa in Lombardia del Beccafico di Provenza*. Rend. R. Inst. Lomb. (ii.) x, fasc. xx.

Although the title only refers to *Melizophilus provincialis*, the author writes a discursive paper upon the ornithology of Lombardy in general, and the district of Pavia and Brescia in particular.

PAVESI, P. Studi anatomici sopra alcuni uccelli. Ann. Mus. Genov. ix. pp. 66-82.

Observations upon the convolutions of the trachea in *Manucodia keraudreni*, with illustrations, and on some members of the genus *Diomedea*.

PELZELN, A. VON. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1876. Arch. f. Nat. 1877, pp. 1-56.

Another of the author's annual records of ornithological literature, compiled with his usual care.

——. Description of a new species of *Calliste*, and of a new Humming-Bird of the genus *Heliangelus*. Ibis, 1877, pp. 337-339 [*Tanagridæ*, *Trochilidæ*].

PREJEVALSKY, N. The Birds of Mongolia, the Tangut Country, and the Solitudes of Northern Tibet. Orn. Misc. ii. pp. 134-204, 271-279, 283-320, 379-389, 417-438, pls. i.-v.; iii. pp. 47-53.

This technical portion of the explorer's work, not included in the English edition made by Mr. E. Delmar Morgan, has now been translated by Mr. Carl Craemers; the original plates are also reproduced with fidelity. [*Cf.* Zool. Rec. xiii. *Aves*, p. 21.]

RADAKOFF, B. Hand-Atlas der geographischen Ausbreitung der im Europäischen Russland nistenden Vögel. Moscow: 1876, folio.

The first instalment of a series of maps, coloured so as to indicate the range of the birds which breed in Russia.

RAMSAY, E. P. List of Australian Game Birds and other species which should be protected by the "Game Preservation Act." P. Linn. Soc. N. S. W. i. pp. 182-196.

——. Remarks on the large number of Game Birds which have of late been offered for sale in Sydney. *Tom. cit.* pp. 215-220.

——. Notes of a Collection of Birds from New Britain, New Ireland, and the Duke of York Islands, with some remarks on the Zoology of the Group. *Tom. cit.* pp. 369-376.

This collection was formed by the Rev. G. Brown and Mr. J. Cockerell, and the former having sent to Mr. P. L. Sclater a set of all the species obtained, results are recorded in P. Z. S. 1877, pp. 96-114.

—— & CASTELNAU, COMTE DE. Notes of a Collection of Birds from the Norman River, Gulf of Carpentaria, with descriptions of some new species. *Tom. cit.* pp. 379-386.

106 species are enumerated, 3 of which are described as new, whilst 1 is doubtful [*Motacillidæ*, *Fringillidæ*, *Dicaeidæ*, *Scolopacidæ*].

——. Notes on a Collection of Birds from Port Moresby; with descriptions of some new species. *Tom. cit.* pp. 386-395.

This collection, numbering over 200 skins, was obtained by Mr. A. Goldie, chiefly on the Laloki River, and within a radius of fifteen miles of Port Moresby; and of the 87 species enumerated, at least 40 are Australian. Several are doubtfully identified, and 3 are described as new [*Alcedinidæ*, *Laniidæ*, *Ploceidæ*].

RAMSAY, E. P. Description of some new species of Birds from New Britain, New Ireland, Duke of York Island, and the South-East Coast of New Guinea. *Op. cit.* ii. pp. 104-107.

Four species are described [*Psittacidae*, *Strigidae*, *Meliphagidae*].

- Descriptions of some rare Eggs of Australian Birds, and a Note on the Eggs of certain species of *Megapodius*. *Tom. cit.* pp. 107-112.
- Notes on some Birds from Savage Island, Tutuila, &c., in the collection of the Rev. Mr. Whitmee. *Tom. cit.* pp. 139-142.
- Tabular List of all the Australian Birds at present known, showing the distribution of the species. *Tom. cit.* pp. 177-203.
- Remarks on the foregoing List of Australian Birds. *Tom. cit.* pp. 204-212.

The author shows the progress which has been made in Australian ornithology since the publication of Mr. Gould's works; remarks upon geographical distribution, corrects synonymy, and describes a species which he considers entitled to specific distinction [*Laniidae*].

- [For papers descriptive of or relating to single species, see also *Psittacidae*, *Sylviidae*, *Ploceidae*, *Fringillidae*, *Strigidae*.]
- List of Birds met with in North-Eastern Queensland, chiefly at Rockingham Bay. Pt. iii. P. Z. S. 1877, pp. 335-351.

The conclusion of a former paper (*op. cit.* 1875, p. 603, 1876, p. 123), the total number of species recorded being 292. A new species of *Sittella* is also described from Port Denison, and a few corrections are made of errors in former contributions.

RAMSAY, R. G. WARDLAW. Notes on some Burmese Birds. *Ibis*, 1877, pp. 452-473.

103 species are enumerated, and 2 are figured [*Pycnonotidae*].

REED, E. C. Apuntes de la Zoologia de la Hacienda de Cauquenes, Provincia de Colchagua. Santiago de Chili: 1877, 8vo, pp. 37.

This paper contains some interesting field-notes.

REICHENOW, A. Die ornithologischen Sammlungen der Deutschen Expedition nach der Loango-küste. (Mit einer Einleitung von Dr. Falkenstein.) J. f. O. 1877, pp. 1-30.

The total number of species enumerated is 237, including 4 new species described at p. 103. Dr. Falkenstein's notes on the colour of the soft parts of many of the specimens are valuable. [*Bucerotidae*, *Alcedinidae*, *Laniidae*, *Pycnonotidae*.]

- Systematische Uebersicht der Schreitvögel (Gressores), einer natürlichen die *Ibidae*, *Ciconidae*, *Phanicopteridae*, *Scopidae*, *Balenicipidae*, und *Ardeidae*, umfassenden Ordnung. *Tom. cit.* pp. 113-171, 225-277, pls. i. & ii.

A monographical notice, with illustrations of osteology, and a diagram showing supposed affinities. Three new sub-genera are instituted [*Ardeidae*].

REID, G. SAVILE. The Birds of the Bermudas. Zool. 1877, pp. 393-424, 473-493.

A valuable supplement to J. Matthew Jones's "Naturalist in Bermuda" (1859).

REYNOLDS, H. S. Letter on the Winter Birds of Arkansas. Am. Nat. xi. pp. 307 & 308.

RIDGWAY, R. The Birds of Guadalupe Island discussed with reference to the present genesis of species. Bull. Nutt. Orn. Club, ii. pp. 58-66.

Some very interesting remarks upon a small collection of only eight species, obtained by Dr. E. Palmer on this little island off the Californian coast. The affinities of these species are almost entirely with those of Western North America, there being no peculiar types, and each species having a more or less closely related representative on the continent.

— United States Geological Exploration of the 40th Parallel. Pt. III.: Ornithology. Washington: 1877, 4to, pp. 307-667.

This report treats principally of the Great Basin between 39° and 42° N. lat., and of the neighbourhood of Sacramento City, California. The total number of species of birds observed is 262, and the descriptions are accompanied by full and highly interesting field-notes respecting habitats, manners, and nidification; much light is also thrown upon geographical distribution.

RIESENTHAL, O. v. Die Raubvögel Deutschlands und des angrenzenden Mitteleuropas. Cassel: 1876-77, 4to, pts. ii.-xii., and Atlas, sm. fol. pts. ii.-xiv. [cf. Zool. Rec. xiii. Aves, p. 24].

This work, with its chromo-lithographic illustrations, is now concluded. The representations are of very unequal merit, and the nomenclature employed is often antiquated.

RINK, H. Danish Greenland: its People and its Products. Edited by Dr. Robert Brown. London: 1877, 8vo, 463 pp.

An English edition of the great Danish work, containing a list of the birds, after A. Newton and H. Reinhardt.

ROOSEVELDT, T., JUN., & MINOT, H. D. The Summer Birds of the Adirondacks, in Franklin County, New York. 8vo, 4 pp.

ROWLEY, G. D. On the Extinct Birds of the Mascarene Islands. Orn. Misc. ii. pp. 123-133, pls. lii. & liii.

A summary of the particulars known respecting the Dodo and the Solitaire, with reproductions of the respective illustrations by P. van der Broeke and H. le Roy.

— On a few Species belonging to the genus *Loriculus*. Tom. cit. pp. 231-254. [*Psittacide*.]

— The Birds of the Fiji Islands. Tom. cit. pp. 393-396.

Two species are discussed and figured [*Prionopide*, *Laniide*].

RUSSELL, I. C. The Giant Birds of New Zealand. *Am. Nat.* xi. pp. 11-21.

A popular article on the *Apterygidae* and *Dinornithidae*, and the author's experiences of the Moa-caves.

SALVADORI, T. Catalogo di una seconda collezione di uccelli raccolti dal Sig. L. M. D'Albertis, nell' Isola Yule e sulla vicina costa della Nuova Guinea; e di una piccola collezione della regione bagnata dal Fiume Fly. *Ann. Mus. Genov.* ix. [1876] pp. 7-49.

The two collections comprise 124 species, 11 of which are described as new [*Psittacidae*, *Cuculidae*, *Alcedinidae*, *Meliphagidae*, *Pycnonotidae*, *Sylviidae*, *Eupetidae*, *Fringillidae*, *Columbidae*].

—. Intorno a due piccole collezioni di uccelli, l'una di Pettà (Isola Sanghir) e l'altra di Tifora e di Batang Ketcil, inviate dal Signor A. A. Bruijn al Museo Civico di Genova. *Tom. cit.* [1876] pp. 50-65.

28 species are enumerated from Pettà, 4 of which are new; and from the latter places 6 species are recorded [*Pittidae*, *Dicaeidae*, *Sturnidae*].

—. Osservazioni intorno alle specie del genere *Myristicivora*, Rchb. *Tom. cit.* [1877] pp. 265-277.

The species of this genus of Fruit Pigeons are discussed, and cuts are given of the tails of 3 of them [*Columbidae*].

—. Intorno alle specie del genere *Talegallus*, Less. *Tom. cit.* [1877] pp. 327-334.

Two species are described.

—. *Prodromus Ornithologiae Papuasie et Moluccarum.* Pt. I. *Paradiseidae*; tom. cit. [1876] pp. 188-193. II. *Columbae*; pp. 194-208. III. *Psittaci*; op. cit. x. pp. 21-37. IV. *Bucerotidae*, *Meropidae*, *Alcedinidae*, *Coraciidae*, *Podargidae*, *Caprimulgidae*, *Cypselidae*; tom. cit. pp. 299-312.

Of the first group, 31 species are enumerated; of the second, 90 species, 3 of which are described as new, and 1 is named provisionally. In the *Psittaci*, 92 species are recorded, 2 genera being erected, and 4 new species named. In part iv., only 1 new species is described [*Alcedinidae*].

—. Note intorno ad alcuni uccelli raccolti durante la esplorazione del Fiume Fly, per L. M. D'Albertis, C.M.Z.S. Traduzione, con note. *Op. cit.* x. pp. 5-20.

A translation, with notes, of an important paper originally published in the "Sydney Mail," and reprinted in "Ibis," 1877, p. 363. [See D'ALBERTIS.]

—. Catalogo della prima collezione di uccelli fatta nella Nuova Guinea nel 1872 dal signor L. M. D'Albertis. *Tom. cit.* pp. 111-167.

A complete account of the collection, containing altogether 180 species, of which only the novelties and rarities had hitherto been described.

SALVADORI, T. Intorno alle Specie di Nettarinie della Papuasie, delle Molucche, e del grupo di Celebes. Atti Acc. Tor. xii. pp. 299-321.

The species noticed belong to the genera *Hermodia*, *Æthopyga*, *Cyrtostomus*, and *Anthothreptus*.

— Notes on some Birds mentioned by Dr. Cabanis and Herr Reichenow as collected in Papuasie and in the Moluccas during the voyage of the "Gazelle." P. Z. S. 1877, pp. 194-196.

Questions the correctness of some identifications and localities in J. f. O. 1876, pp. 319-330.

— Notes on two Birds from the Fiji Islands [*Rhipidura*, *Lamprolia*]. Ibis, 1877, pp. 142-144.

— Letter pointing out that *Sturnus unicolor* is only of accidental occurrence on the mainland of Italy, although common and resident in Sicily and Sardinia. Tom. cit. p. 399.

— A few Words on the Parrots of the genus *Eclectus*. Tom. cit. pp. 474-476.

SALVIN, OSBERT. Exhibition of and Remarks upon a Volume of Original Drawings, taken by Mr. George Raper during the Voyage of Captain Hunter to Australia in 1788-92. P. Z. S. 1877, p. 95. [*Rallidæ*.]

— Description of a New Genus and Species of Oscines from Costa Rica. Tom. cit. p. 367. [*Ampelidæ*.]

[See also SCLATER, P. L.]

SAUNDERS, HOWARD. Catalogue des Oiseaux du Midi de l'Espagne. Bull. Soc. Z. Fr. i. pp. 315-327; ii. pp. 11-22, 89-98, 185-208.

A summary of the species observed and obtained by Lord Lilford, Col. Irby, and the author, amounting to 339, including rare visitants, [*Alaudidæ*, *Fringillidæ*, *Anatidæ*, *Rallidæ*, *Laridæ*, *Procellariidæ*].

— Reports on the Collections of Birds made during the voyage of H.M.S. 'Challenger.' No. V. On the *Laridæ* collected during the Expedition. P. Z. S. 1877, pp. 794-800.

Seventeen species were obtained, 5 of them from new and 3 from unexpected localities [*Laridæ*].

SCHALOW, H. Tagebuch notizen aus Italien. J. f. O. 1877, pp. 191-202.

— [See also *Laniidæ*.]

SCLATER, P. L. On the Birds collected by Mr. George Brown, C.M.Z.S., on Duke of York Island, and on the adjoining parts of New Ireland and New Britain. P. Z. S. 1877, pp. 96-114.

Of the 73 species obtained, 10 are described as new, and 4 of these are figured. The forms collected show that New Ireland belongs to the Papuan sub-region of the Australian Avifauna. [*Muscicapidæ*, *Dicruvidæ*, *Dicaeide*, *Meliphagidæ*, *Alcedinidæ*, *Psittacidæ*, *Strigidæ*, *Columbidæ*.]

SCLATER, P. L. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.' No. I. General Remarks on the Collections. *Tom. cit.* pp. 534 & 535. No. III. On the Birds of the Admiralty Islands. *Tom. cit.* pp. 551-557.

A week's stay at these almost unvisited islands, situated to the north of New Guinea, in lat. 2° 18' S., long. 146° 44' E., produced 56 specimens belonging to 27 species, no less than 7 of which appear to be new. [*Muscicapidae*, *Meliphagidae*, *Sturnidae*, *Columbidae*, *Megapodidae*.]

—. Description of two new Ant-birds of the Genus *Grallaria*, with a List of the known Species of the Genus. *Ibis*, 1877, pp. 437-451.

Twenty-seven species are enumerated and described, and 2 are figured [*Formicariidae*].

—. [For other papers on single genera and species, see *Anatidae*, *Fringillidae*, *Psittaci*, *Platuleide*.]

— & SALVIN, OSBERT. Description of Eight New Species of South American Birds. *P. Z. S.* 1877, pp. 18-22. [*Tanagridae*, *Fringillidae*, *Tyrannidae*, *Picidae*, *Columbidae*, *Cracidae*.]

— & —. Descriptions of Six New Species of South American Birds. *Tom. cit.* pp. 521-523.

These species are from Ecuador and Peru. [*Mniotiltidae*, *Tanagridae*, *Tyrannidae*, *Cotingidae*, *Anatidae*.]

SEEBOHM, H. Supplementary Notes on the Ornithology of Heligoland. *Ibis*, 1877, pp. 156-165.

A valuable supplement to the notes of Blasius and Cordeaux on this island, and on Gaetke's collection. Some interesting *Turdidae*, *Sylviidae*, &c., recorded. The author is engaged in translating and editing Gaetke's work on the subject.

—. [For other important papers, see *Sylviidae* and *Motacillidae*.]

SHARPE, R. B. Descriptions of 3 apparently New Species obtained by O. Stone in New Guinea. *Nature*, xiv. p. 339.

[*Paradiseidae*, *Dicaeidae*, *Columbidae*, but see *J. L. S.* xiii. p. 503, for rectification of last. Omitted from *Zool. Rec.* xiii.]

—. On the Geographical Distribution of the *Accipitres*. Pt. i. *Vulturidae*. *J. L. S.* xiii. pp. 1-26, pls. i.-ix.

This paper is the first of a series intended to be supplementary to the treatment of the above family with regard to classification, as set forth in the British Museum Catalogue of Birds, pt. i. It is elucidated by maps coloured so as to show the ascertained and probable distribution of the more important species. [Omitted from *Zool. Rec.* xiii.]

—. Contributions to the Ornithology of New Guinea. Pt. i. Notes on a small Collection of Birds from South-eastern New Guinea. *Tom. cit.* pp. 79-83.

Remarks upon 9 species, 1 of which is considered to be new. [*Campephagidae*.] [Omitted from *Zool. Rec.* xiii.]

SHARPE, R. B. Contributions to the Ornithology of New Guinea. Pt. ii. On the Ornithological Collections formed by the late Dr. James in South-eastern New Guinea and Yule Island. *Tom. cit.* pp. 305-321.

Fifty-four species are enumerated, some of them of much interest for their geographical distribution, and 2 species are described as new. [*Alcedinidæ*.]

— Contributions to the Ornithology of New Guinea. Pt. iii. On a new species of Goshawk from the Island of Jobi. *Tom. cit.* pp. 457 & 458, pl. xxii. [*Falconidæ*.]

— Contributions to the Ornithology of New Guinea. Pt. iv. On the Collection of Birds brought by Mr. Octavius C. Stone, from South-eastern New Guinea. *Tom. cit.* pp. 486-505.

A total of 116 species is recorded, and one is described as new [*Sylviidæ*.]

— Catalogue of the Birds in the British Museum. III. Catalogue of *Passeriformes*, or Perching Birds, in the Collection of the British Museum. *Coliormorphæ*, containing the Families *Paradiseidæ*, *Oriolidæ*, *Dicruridæ*, and *Prionopidæ*. London: 1877, 8vo, pp. 344, 14 pls.

The author follows the plan of his former volumes on the *Accipitres* and *Striges*, classifying and describing 367 species of which 15 are well figured. It should be observed, however, that under the head of *Coliormorphæ*, he comprises a somewhat different series from that included by Sundevall under the same term. 7 new generic terms are employed, and 18 new or undescribed species and subspecies are enumerated. [*Corvidæ*, *Paradiseidæ*, *Oriolidæ*, *Laniidæ*.]

— Contributions to the Ornithology of Borneo. Pt. ii. Ibis, 1877, pp. 1-25.

On a collection formed in N.W. Borneo by Mr. Everett, containing 2 new species. [*Pycnonotidæ*, *Dicaidæ*.]

— A Note on the Genus *Orthotomus*. *Tom. cit.* pp. 108-116, pl. ii.

A review and synoptical table of 12 species comprised in this genus. *O. frontalis* and *O. cinereiceps*, spp. nn., described and figured. [*Sylviidæ*.]

— On New Species of Warblers in the Collection of the British Museum. P. Z. S. 1877, pp. 22-24.

Three species are described, two of them from West Africa, the third, which is also the type of a new genus, being from Madagascar. [*Sylviidæ*.]

— Account of the Zoological Collection made during the visit of H.M.S. "Petrel" to the Galapagos Islands. Birds. *Tom. cit.* pp. 65-67.

Five species are enumerated, obtained on Charles and Albemarle Islands.

— Description of a new Species of *Lobiophasis*, and a new Species of *Pitta* from the Lawas River, N.W. Borneo. P. Z. S. 1877, pp. 93 & 94. [*Phasianidæ*, *Pittidæ*.]

SHARPE, R. B. On the Birds Collected by Professor J. B. Steere in the Philippine Archipelago. Tr. L. S. (2) i. pt. vi. pp. 307-355, pls. xlv.-liv.

This collection, consisting of 139 species, supplies much valuable information respecting their distribution throughout the Philippine group. The author intends the paper to be a supplement to Lord Tweeddale's (Walden) Memoir in Tr. Z. S. ix. 6 new genera are proposed, and 26 species are here described for the first time, the other novelties in the collection having recently been described in "Nature," "Cat. Birds B. M.," and "Ibis." [*Picidae*, *Alcedinidae*, *Cuculidae*, *Muscicapidae*, *Pittidae*, *Timeliidae*, *Phyllornithidae*, *Irenidae*, *Brachypodidae*, *Turdidae*, *Paridae*, *Sittidae*, *Sturnidae*, *Eurylemidae*, *Columbidae*.]

— [See LAYARD, E. L., for "Birds of South Africa."]

—, & BOUYIER, A. Études d'Ornithologie Africaine, sur les Collections recueillies dans la région du Congo par MM. le Dr. A. Lucan & L. Petit. Bull. Soc. Z. Fr. i. [1876] pp. 300-314.

One new species is described. [*Sylvidae*.]

SHELLEY, G. E. A Monograph of the *Cinnyridae*, or Family of Sunbirds. Pts. iii.-v. London: 1877, 4to.

The successive issues fully sustain the reputation of their predecessors. [Cf. Zool. Rec. xiii. *Aves*, p. 30.]

SINTENIS, GEBRÜDER. Zur Ornithologie der Dobrudscha. J. f. O. 1877, pp. 59-69.

SMILES, S. The Life of a Scotch Naturalist, Thomas Edward. London: 1877, 8vo, pp. 438.

In addition to numerous field-notes, the work contains an annotated list of the Birds of Banffshire.

STEVENSON, H. Ornithological Notes for 1876. Tr. Norw. Soc. 1876 & 1877, pp. 306-324.

A notice of the occurrences of the rarer Birds in Norfolk and Suffolk, the principal feature being the unsuccessful attempt to induce a Great Bustard to remain and breed.

STÖLKER, O. Beiträge zum Albinismus der Vögel. J. f. O. 1877, pp. 431-444.

— Die Alpenvögel der Schweiz in Photographien von Gebr. Täschler. 2 Serie. St. Fiden, bei St. Gallen: 1877.

STREETS, T. H. Some account of the Natural History of the Fanning Group of Islands. Am. Nat. xi. pp. 65-72. [Cf. Zool. Rec. xiii. p. 31.]

— Contributions to the Natural History of the Hawaiian and Fanning Islands and Lower California. Bull. U. S. Nat. Mus. No. 7.

The most interesting portions of this paper relate to the Fanning group, whence a new species is described. [*Procellariidae*.]

SWINHOE, R. On the Contents of a fourth Box of Birds from Hakodadi in Northern Japan. *Ibis*, 1877, pp. 144-147.

Increases the list to 154 species, and corrects an error of identification.

—. [For other papers, see *Pycnonotidae*, *Troglodytidae*, *Paridae*.]

TACZANOWSKI, L. Revue critique de la Faune Ornithologique de la Sibérie orientale. *Bull. Soc. Z. Fr.* i. [1876], pp. 157-183, 237-264; *op. cit.* ii. pp. 40-52. [*Cf.* *Zool. Rec.* xiii. *Aves*, p. 31.]

—. Liste des Vertébrés de Pologne. II. Oiseaux. *Bull. Soc. Z. Fr.* ii. pp. 133-166.

An interesting notice of the 304 species observed.

—. Liste des Oiseaux recueillis en 1876, au Nord du Pérou par MM. Jelski et Stolzmann. *P. Z. S.* 1877, pp. 319-333.

Ninety-one species are enumerated, 7 new species and 1 new genus being described. In a supplementary list of 25 species, obtained by the same collectors in Central Peru and in Ecuador, a new species of *Turdus* is described. [*Fringillidae*, *Dendrocolaptidae*, *Tyrannidae*, *Picidae*, *Turdidae*.]

—. Supplement à la Liste des Oiseaux recueillis au Nord du Pérou occidental par MM. Jelski et Stolzmann. *Tom. cit.* pp. 744-754.

Thirty-four species are enumerated, 2 being new. [*Cracidae*, *Rallidae*.] To these are added notes on the nidification and habits of nearly 20 species already noticed.

THIEL, H. Rapport à M. le Professeur Nordenskiöld. *Upsala*: 1877, pp. 64.

Report on the Swedish Expedition of 1876 by land to the Yenisei, Siberia. Some interesting facts in geographical distribution are recorded. [*Sylviidae*.]

TRISTRAM, H. B. List of Birds collected by the Survey party in Palestine. Palestine Exploration Fund Quarterly Statement, 1876, pp. 200-204.

Sixty-two species, with the Arabic names of some of them.

TSCHUSI ZU SCHMIDHOFEN, V. VON. Ornithologische Mittheilungen aus Oesterreich und Ungarn (1876). *J. f. O.* 1877, pp. 56-59.

—. Die Vögel Salzburg's. Eine Aufzählung aller in diesem Lande bisher beobachteten Arten, mit Bemerkungen und Nachweisen über ihr Vorkommen. Salzburg: 1877, 8vo, pp. 90.

Principally a reprint, with additional notes, of the list originally published in *Zool. Gart.* 1876.

TWEEDDALE, MARQUIS OF. Description of 4 new Species of Birds from the Indian Region. *Ann. N. H.* (4) xx. pp. 94-96.

[*Sylviidae*, *Ploceidae*, *Dicaeidae*, *Muscicapidae*.]

—. Description of some new Species of Birds. *Tom. cit.* p. 533.

[*Psittaci*, *Alcedinidae*, *Picidae*, *Bucerotida*, *Timeliidae*, *Pycnonotidae*, *Muscicapidae*, *Dicaeidae*, *Nectariniidae*, *Columbidae*.]

1877. [VOL. XIV.]

TWEEDDALE, MARQUIS OF. On a Collection of Birds made by Mr. E. C. Buxton in the District of Lampong, S.E. Sumatra. *Tom. cit.* pp. 283-323.

A catalogue, with observations, on 151 species obtained during a five months' journey. 2 species appear to be new, both of which are figured; one [*Sylviidae*] being described here, and the other [*Ægithinidae*] in P. Z. S.

— Letter on identity of *Pellorneum minor*, Hume, through *P. subochraceum*, Swinhoe, with *P. tickelli*, Blyth. *Tom. cit.* pp. 385-387 and pp. 451 & 452. [*Cf.* Oates, Str. Feath. 1876, p. 406.]

— Letter on Identification and Synonymy of *Batrachostomi*. *Tom. cit.* pp. 388-392. [*Podargidae*.]

— Description of 3 New Species of Birds from the Indian Region. P. Z. S. 1877, pp. 366 & 367. [*Ægithinidae*, *Cuculidae*.]

— Note on the Species of the Genus *Batrachostomus* inhabiting the Indian Region. *Tom. cit.* pp. 420-444. [*Podargidae*.]

An important revision of this much confused genus, with full and rectified synonymy, ample descriptions of the various plumages, and 5 plates.

— Reports on the Collections of Birds made during the Voyage of H. M. S. "Challenger." No. II. On the Birds of the Philippine Islands. *Tom. cit.* pp. 535-551.

Forty-nine species are enumerated, 7 of them being previously undescribed. [*Psittaci*, *Podargidae*, *Bucerotidae*, *Dicruridae*, *Dicaeidae*, *Nectariniidae*, *Columbidae*.]

— Contributions to the Ornithology of the Philippines. No. I. On the Collection made by Mr. A. H. Everett in the Island of Luzon. *Tom. cit.* pp. 686-703.

This collection contained 85 species, many of which had not hitherto been recorded from Luzon, and 3 species recently described as new in Ann. N. H. (4) xx. pp. 94-96, are now figured. [*Sylviidae*, *Dicaeidae*, *Ploceidae*.]

— Contributions to the Ornithology of the Philippines. No. II. On the Collection made by Mr. A. H. Everett on the Island of Zebu. *Tom. cit.* pp. 755-769.

Seventy-five species were obtained, 54 of which had not previously been recorded from Zebu, and 6 proved to be new, 4 of them being figured. [*Oriolidae*, *Pycnonotidae*, *Dicaeidae*.]

— Contributions to the Ornithology of the Philippines. No. III. On the Collection made by Mr. A. H. Everett in the Island of Mindanao. *Tom. cit.* pp. 816-834.

Eighty-one species are enumerated, principally from the north and north-eastern portions of this little-explored island, 43 being previously unrecorded from thence, and 9 being new to science, 3 of which are here described for the first time, and 4 species are figured. [*Psittaci*, *Sylviidae*, *Dicaeidae*, *Nectariniidae*.]

WADE, C. H. Notes on the Venous System of Birds. J. L. S. xii. pp. 531-535.

A paper intended to be preliminary to a more extended series of observations on the subject. [Omitted from Zool. Rec. xiii.]

WEYENBERGH, H. Vögel, in R. Napp's "Die Argentinische Republik," Buenos Aires: 1876, 8vo, pp. 156-163.

WHARTON, H. T. A List of British Birds, the Genera arranged according to Sundevall's Method. The Nomenclature revised by the Author. London: 1877, 12mo, pp. 20.

WHYTE, A. Ornithological Notes taken during a Voyage from Ceylon to England. Ibis, 1877, pp. 148-151.

Remarks on land and other birds observed in the Indian Ocean and Red Sea.

—, Notes on Captain Legge's Paper on Additions to the Ceylon Avifauna. Str. Feath. 1876, p. 201.

WIEPKEN, C. F. Zur Vogelfauna der Nordsee-Insel Wangerooge. J. f. O. 1877, pp. 426-431.

WÜSTNEI, C. Ornithologische Notizen aus Mecklenburg. *Tom. cit.* pp. 31-35.

A notice of the species found in that duchy, with their local names.

ACCIPITRES.

VULTURIDÆ.

Vulturidæ: Geographical Distribution of; R. B. Sharpe, J. L. S. xiii. pp. 1-26, pls. i.-ix.

Gyps africanus figured; B. du Bocage, Orn. Angola, pt. i. pl. ix.

Neophron percnopterus figured; O. Riesenthal, Raubv. Deutschl. pl. xlvii.

Vultur monachus (pl. xlviii.), *V. fulvus* (pl. xlix.) figured; *id. l. c.* *V. auricularis*: its nesting in confinement; J. H. Gurney, Ibis, 1877, p. 237.

FALCONIDÆ.

See GURNEY, *suprà*, p. 11.

Accipiter nisus in Burma; W. Ramsay, Ibis, 1877, pp. 454.

Aquila adalberti, its changes of plumage described; J. H. Gurney, Ibis, 1877, pp. 219-221. *A. culleni* identified with *A. rapax*; *id. tom. cit.* pp. 227-230. *A. albicans*, Abyssinia, distinguished from *A. rapax*; *id. tom. cit.* pp. 230-233.

Aquila clanga [*A. nipalensis*], young in down figured; A. Marchand, R. Z. (3) v. p. 356, pl. cxli.

Aquila fulvescens considered a distinct species and fully described; J. H. Gurney, Ibis, 1877, pp. 325-329.

Aquila imperialis (pls. xxxiv. & xxxv.), *A. fulva* (pl. xxxvi.), *A.*

chrysaetos (pl. xxxvii.), *A. naevia* (pl. xxxviii.), *A. orientalis* and *A. clanga* (pl. xxxix.), *A. pennata* (pl. xl.), *A. bonelli* (pl. xlv.) figured; O. Riesen-
thal, Raubv. Deutschl. *A. pennata* and *A. minuta*, remarks on supposed
distinction; N. Severtzoff, Bull. Soc. Z. Fr. ii, p. 25. Reply by L. Bureau,
tom. cit. p. 53.

Archibuteo strophiatatus figured; David & Oustalet, Ois. Chine, Atlas,
pl. vii.

Astur meyerianus, sp. n., R. Sharpe, J. L. S. xiii. p. 457, figured, pl. xxii.,
Island of Jobi. *A. tenuirostris*, sp. n., F. Brüggemann, Abh. Verh. Brem.
v. p. 43; bill figured, pl. iii. fig. 2, Celebes. *A. iogaster*, bill figured with
above. *A. [Accipiter] nisus* (pl. vi.) *A. palumbarius* (pl. v.) figured; O.
Riesenthal, Raubv. Deutschl.

Asturina nitida var. *plagiata* figured; H. W. Henshaw in Wheeler's
Rep. Surv. v. pl. xv.

Buteo desertorum and *B. plumipes*, note on; J. H. Gurney, Str. Feath.
1877, p. 65. *B. ferox* (pl. xiv.), *B. desertorum* (pl. xv.) figured; O.
Riesenthal, Raubv. Deutschl. *B. hemilasius* figured; David & Oustalet,
Ois. de la Chine, Atlas, pl. ix.

Circæus gallicus figured, O. Riesenthal, Raubv. Deutschl. pl. xlv.

Circus: remarks on the European species; W. Blasius, J. f. O. 1877,
p. 75. *Circus æruginosus* (pls. ix. & x.), *C. cineraceus* (pl. xi.), *C. pygargus*
(pl. xii.), *C. pallidus* (pl. xiii.), figured, O. Riesenthal, Raubv. Deutschl.
pt. ii. *C. melanoleucus*: its sexual plumage discussed; A. O. Hume,
Str. Feath. 1877, p. 11. *C. spilonotus* obtained in North Japan; R. Swin-
hoe, Ibis, 1877, p. 144.

Elanus melanopterus figured; O. Riesenthal, Raubv. Deutschl. pl. xvi.

Falco babylonicus figured by A. Anderson, P. Z. S. 1876, pl. xxxii.
Believed to be *F. barbarus*; A. O. Hume, Str. Feath. 1877, p. 140. [This
view is confirmed by J. H. Gurney, P. Z. S. 1878, p. 1.]

Falco candicans, pls. xvii. & xviii. [= *F. islandus*], *F. arcticus* (pl. xix.),
F. gyrfalco (pls. xx. & xxi.), *F. sacer* (pl. xxii.), *F. feldegi* (pl. xxiii.),
F. peregrinus, pls. xxiv. & xxv.), *F. subbuteo* (pl. xxviii.), *F. eleonoræ*
(pl. xxix.), *F. asalon* (pl. xxx.), *F. tinnunculus* (pl. xxxi.), *F. cenchris*
(pl. xxxii.), *F. rufipes* (pl. xxxiii.), figured; O. Riesenthal, Raubv.
Deutschl. *F. dickersoni*, R. B. Sharpe in Cat. Birds, i. p. 447, = *F.*
dickinsoni; P. L. Slater, Ibis, 1877, p. 260. *F. hendersoni*, observa-
tions on; W. E. Brooks, Str. Feath. 1877, p. 48.

Gypohierax angolensis in the Transvaal; T. Ayres, Ibis, 1877, p. 340.

Gypætus barbatus figured; O. Riesenthal, Raubv. Deutschl. pl. xlvii.

Halæetus leucogaster found in Borneo; R. B. Sharpe, Ibis, 1877, p. 3.
H. albicilla figured; O. Riesenthal, Raubv. Deutschl. pls. xli. & xlii.
Proof of its living upwards of 80 years in confinement; Mützel, J. f. O.
1877, p. 108.

Henicopernis longicauda on Fly River, New Guinea; D'Alberty, Ibis,
1877, p. 365.

Limnaetus kieneri occurs in Batchian, Java, and Ceylon; J. H. Gur-
ney, Ibis, 1877, p. 433.

Machæramphus alcinus found in New Guinea to the east of Yule
Island; R. B. Sharpe, J. L. S. xiii. p. 308.

Microhierax chinensis figured ; David & Oustalet, Ois. Chine, Atlas, pl. viii.

Milvus regalis and *M. migrans* figured ; O. Riesenthal, Raubv. Deutschl. pt. ix. pls. vii. & ix.

Morphnus guianensis, immature plumage described ; J. H. Gurney, Ibis, 1877, p. 435.

Pandion haliaetus figured ; O. Riesenthal, Raubv. Deutschl. pl. xliii.

Tinnunculus inglisi, sp. n., A. O. Hume, Str. Feath. 1877, p. 5, Cachar.

STRIGIDÆ.

Ascalaphia coromanda occasionally lays spotted eggs ; A. Anderson, P. Z. S., 1877, p. 807.

Athene whiteleyi (pl. iv.) and *A. brodiei* (pl. v.) figured ; David & Oustalet, Ois. Chine, Atlas. *A. glauz* figured ; H. E. Dresser, B. Eur. pts. lix. & lx.

Lempijus glabripes figured, David & Oustalet, Ois. Chine, Atlas, pl. vi.

Ninox odiosa, sp. n., differentiated from *N. punctata* ; P. L. Slater, P. Z. S. 1877, p. 108, New Britain. *N. novæ-britanniæ*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 104, New Britain [? = *N. odiosa*, Sc.]

Nyctea nivea. Irruption of in United States ; T. M. Brewer (quotation from letter), Ibis, 1877, pp. 131 & 132 ; also Ireland, *l. c.*

Ptynx fuscescens figured ; David & Oustalet, Ois. Chine, Atlas, pl. ii.

Strix uralensis : remarks on ; J. Jäckel, Zool. Gart. 1877, p. 309. *S. nivea* (pl. i.), *S. uralensis* (pl. li.), *S. nisoria* (pl. lii.), *S. bubo* (pl. liv.), *S. aluco* (pl. lvii.), *S. noctua* and *S. dusypus* (pl. lviii.), *S. lapponica* (pl. lx.), figured ; O. Riesenthal, Raubv. Deutschl.

Syrnium davidi figured ; David & Oustalet, Ois. Chine, Atlas, pl. iii. *S. uralense* in Moravia ; J. Talsky, Mitt. Orn. Ver. Wien, 1877, p. 8.

PSITTACI.

Agapornis swinderini, Kuhl, figured ; J. f. O. pl. v. fig. 2, Liberia.

Chalcopsittacus chloropterus, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 15, near Yule Island, New Guinea.

Charmosynopsis, g. n., differing from *Charmosyna* in the first four remiges not being abruptly subulate at the apex ; type, *Charmosyna pulchella*, G. R. Gray : *id. op. cit.* x. p. 37, note.

Coriphilus kuhli. Its true home is the Fanning group ; T. H. Streets, Bull. U. S. Nat. Mus. No. 7, p. 13.

Cyclopsittacus fuscifrons, sp. n., T. Salvadori, *op. cit.* ix. p. 14, Fly River, New Guinea.

Dasyptilus pecqueti, Fly River, New Guinea ; M. L. D'Alberty, Ibis, 1877, p. 365.

Eclectus. W. A. Forbes on this genus ; Ibis, 1877, pp. 274-283. Remarks in reply to above ; T. Salvadori, Ibis, 1877, p. 474. *E. polychlorus* is the ♂ of *E. grandis* ; *id. tom. cit.* p. 476. Further proof of the red

birds being the ♀ of the green; A. B. Meyer, P. Z. S. 1877, p. 800. *E. polychlorus*: tail figured; *id. l. c.* pl. lxxix.

Geoffroyius keyensis, sp. n., (Schl. MS.) T. Salvadori, Ann. Mus. Genov. x. p. 29, Arn Island and S.E. New Guinea. *G. rhodops*, Schleg., nec G. R. Gr., renamed *schlegeli*, *id. ibid.* Moluccas. *G. simplex* figured; J. Gould, B. New Guinea, pl. v.

Loriculus panayensis, sp. n., differentiated from *L. regulus*; Lord Tweeddale, P. Z. S. 1877, p. 538, Ilo-ilo, Philippine Islands. *L. tener*, sp. n., P. L. Sclater, P. Z. S., 1877, p. 107, Duke of York Island; figured, *id.* Orn. Misc. pl. lxxii. figs. 2 & 3, with figure of *L. aurantiifrons* for comparison on same plate. *L. aurantiifrons* figured; J. Gould, B. New Guinea, pt. v. *L. hartlaubi* figured; Lord Tweeddale, P. Z. S. 1877, pl. lxxxii. Remarks on a few species belonging to this genus; G. D. Rowley, Orn. Misc. ii. pp. 232. *L. catumene*, *L. regulus*, *L. exilis*, and *L. stigmatus*, figured, *id. tom. cit.* pls. lvii.-lx.

Lorius erythrothorax, sp. n., T. Salvadori, Ann. Mus. Genov. x. p. 32, S. E. New Guinea. *L. flavo-palliatas*, sp. n., *id. l. c.* p. 33, Moluccas.

Nasiterna pusilla, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 104, Port Moresby, New Guinea.

Nestor meridionalis: on a tendency to deformity in its bill; W. L. Buller, Tr. N. Z. Inst. ix. p. 340; figured, pl. xiv.

Oreopsittacus, g. n.; type, *Trichoglossus arfuki*, Meyer: T. Salvadori, Ann. Mus. Genov. x. p. 37, New Guinea.

Palaeornis derbyanus figured, David & Oustalet, Ois. Chine, Atlas, pl. i. *P. melanorrhynchus*; its plumage discussed; A. O. Hume, Str. Feath. 1877, p. 21.

Pionus. On the genus; P. L. Sclater, Orn. Misc. iii. p. 5. *P. coralinus* and *P. tumultuosus* figured; *id. l. c.* pls. lxxx. & lxxxii.

Platycercus mastersianus, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 27, Interior of New South Wales. *P. rowleyi*, Buller, figured; G. D. Rowley, Orn. Misc. ii. pl. i. *P. tabuensis* peculiar to Ena, Friendly group; O. Finsch, P. Z. S. 1877, p. 771.

Psittacella brehmi figured; J. Gould, B. New Guinea, pt. iv.

Psittuteutes rubro-notatus and *P. subplacens* figured; J. Gould, B. New Guinea, pt. v.

Tunygnaethus everetti, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 533, N. Mindanao.

Trichoglossus flavicans, sp. n., J. Cabanis & A. Reichenow, SB. nat. Fr. 1876, p. 73, New Hanover, figured, *id.* J. f. O. 1877, pl. v. fig. 1. *T. muschenbræki* figured; J. Gould, B. New Guinea, pt. v.

PICARIÆ.

PICIDÆ.

Celeus subflavus, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1877, p. 21, Brazil.

Chloronerpes dignus, sp. n., *id. l. c.* p. 20, ♂ figured, pl. i. Colombia.

Chrysocolaptes maculiceps and *C. erythrocephalus*, spp. nn., R. B. Sharpe, Tr. L. S. (2) i. pp. 314 & 315, pl. xlv. figs. 1 & 2, Negros and Palawan, Philippines. *C. xanthocephalus*, figured, J. Gould, B. Asia, pl. xxx.

Colaptes auratus: notes on its breeding habits; A. Lyle, Am. Nat. xi. p. 747.

Gecinus sharpii occurs in the French Pyrenees; A. Lacroix, Bull. Soc. H. N. Toulouse, 1877, p. 133.

Hemilophus fischeri, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 454, Borneo.

Micropternus, Blyth: remarks on the genus; A. O. Hume, Str. Feath. 1877, pp. 472-482.

Melanerpes erythrocephalus, its carnivorous habits; C. Aldrich, Am. Nat. xi. p. 308.

Mulleripicus wallacii, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 533, Macassar. *M. fuliginosus*, sp. n., *id. l. c.* p. 534, N. Mindanao; figured, *id. P. Z. S.* 1877, pl. lxxxiii.

Picumnus sclateri, sp. n., L. Taczanowski, P. Z. S. 1877, p. 327, North Peru.

Yungipicus scintilleps figured; David & Oustalet, Ois. Chine, Atlas, pl. xcix.

TROGONIDÆ.

Harpactes oreskios, its nidification; C. T. Bingham, Str. Feath. 1877, p. 50.

Pharomacrus costaricensis, Cab., remarks on; A. Boucard, Orn. Misc. iii. p. 21.

ALCEDINIDÆ.

Actenoides hombroni ad., *A. lindsayi*, and *A. concretus*, figured; J. Gould, B. Asia, pt. xxix.

Ceryle lugubris, figured, David & Oustalet, Ois. Chine, Atlas, pl. x.

Ceyx argentata, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 533; *id. P. Z. S.* 1877, p. 822, Dinagat, Philippine Islands.

Cyanalcyon stictolema, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 20, Fly River, New Guinea.

Dacelo intermedius, sp. n., *id. l. c.* ix. p. 21, New Guinea.

Halcyon cyanescens, sp. n., J. Cabanis & A. Reichenow, J. f. O. 1877, p. 103, Loango. *H. cyanocephala*, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 51, Celebes. *H. godeffroyi*, sp. n., differentiated from *H. albicilla*, Less.; O. Finsch, P. Z. S. 1877, p. 408, Marquesas Islands. *H. winchelli*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. vi. p. 318; figured pl. xlvii., Basilan, Philippines.

Melidora collaris, sp. n., R. B. Sharpe, J. L. S. xiii. p. 313, S.E. New Guinea. *M. goldiei*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 389, Laloki River, Port Moresby, New Guinea.

Tanyptera micro [r] *rhyncha*, sp. n., R. B. Sharpe, J. L. S. xiii. p. 311, S.E. New Guinea. *T. nigriceps*, sp. n., allied to, but very distinct from, *T. sylvia*; P. L. Sclater, P. Z. S. 1877, p. 105, Duke of York Island. *T. obiensis*, sp. n., T. Salvadori, Ann. Mus. Genov. x. p. 302, Obi.

BUCEROTIDÆ.

Anorrhinus albo-cristatus, pt. i., *A. comatus*, pt. ii., *A. leucolophus*, pt. iv., figured; D. G. Elliot, Mon. Bucerot.

Anthracoceros malabaricus, pt. ii., *A. malayanus*, pt. iii., *A. coronatus*, p. iv., figured; *id. op. cit.*

Buceros albo-tibialis, sp. n., J. Cabanis & A. Reichenow, J. f. O. 1877, p. 103, Loango. *B. mindanensis*, differentiated from *B. hydrocorax*; Lord Tweeddale, P. Z. S. 1877, p. 543, Pasananea, Philippine Islands. *B. rhinoceros* figured; D. G. Elliot, Mon. Bucerot, pt. iii. *B. bicornis*, Linn., remarks on; *id. Ibis*, 1877, p. 416.

Bucorax, remarks on genus; J. V. Barboza du Bocage, Bull. Soc. Z. Fr. ii. p. 373.

Bucorvus pyrrhops, sp. n., D. G. Elliot, Ann. N. H. (4) xx. p. 171, Congo region. *B. abyssinicus* figured; D. G. Elliot, Mon. Bucerot., pt. ii.

Bycanistes subcylindricus, pt. i., *B. cristatus*, pt. iii. figured; *id. op. cit.* *Craniorrhinus waldeni*, sp. n., R. B. Sharpe, J. L. S. xiii. p. 155, Ilo-Ilo, Philippines. *C. waldeni*, pt. i., and *C. cassidia*, pt. ii., figured; D. G. Elliot, Mon. Bucerot. pl. i.

Dichoceros bicornis figured; *id. op. cit.* pt. iv.

Hydrocorax planicornis figured; *id. op. cit.* pt. ii.

Lophoceros nasutus figured; *id. op. cit.* pt. iii.

Penelopides affinis, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 534, and with cut of head and of that of *P. panini*, P. Z. S. 1877, pp. 824 & 825, N. Mindanao. *P. panini* figured; D. G. Elliot, Mon. Bucerot. pt. iv.

Rhinoplax (Buceros) vigil figured; *id. op. cit.* pt. i.

Rhytidoceros undulatus figured; *id. op. cit.* pt. ii. Rectification of synonymy; Lord Tweeddale, *Ibis*, 1877, pp. 292-295.

Sphagolobus atratus figured; D. G. Elliot, Mon. Bucerot. pt. i.

Tockus monteiri, pt. i., *T. flavirostris*, pt. ii., *T. hemprichi*, pt. iii., *T. gingalensis* and *T. griseus*, pt. iv., figured; *id. op. cit.*

INDICATORIDÆ.

Indicator stictithorax, sp. n., A. Reichenow, J. f. O. 1877, p. 110, Cameroons, W. Africa.

CAPITONIDÆ.

Megalasma davidsoni, sp. n., A. O. Hume, Str. Feath. 1877, p. 108, Tenasserim.

Pogonorrhynchus leucogaster, sp. n., B. du Bocage, J. Sc. Lisb. xxi.

p. 63, West Africa. *P. eogaster*, Cab., figured; A. Bouvier, Bull. Soc. Z. Fr. i. [1876] pl. vi. fig. 2, Landana, W. Africa: = *P. bidentatus* (Shaw), *id. op. cit.* ii. p. 76.

CUCULIDÆ.

Chalcites hodgsoni and *C. xanthorrhynchus* figured; J. Gould, B. Asia, pt. xxx. *C. meyeri* figured; *id.* B. New Guinea, pt. v.

Chrysococcyx limborgi, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 366, Tenasserim.

Cuculus virescens, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 59, Celebes. *C. asturinus*, sp. n., *id. tom. cit.* p. 101, Gorontalo. *C. canorus* figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Dryococcyx, g. n.: type, *D. harringtoni*, sp. n.; R. B. Sharpe, Tr. L. S. (2) i. pt. vi. p. 321, and profile figured, Balabac, Philippines.

Hierococcyx nanus, sp. n., A. O. Hume, Str. Feath. 1877, p. 490, South Tenasserim. *H. nasicolor*, remarks on; A. O. Hume, Str. Feath. 1877, p. 96.

Polophilus nigricans, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 17, New Guinea [the genus is hitherto known only from Australia].

CORACIIDÆ.

Eurystomus afer in the Transvaal; T. Ayres, Ibis, 1877, p. 342.

CAPRIMULGIDÆ.

Caprimulgus ægyptius, Licht., has occurred in Heligoland; H. Seebohm, Ibis, 1877, p. 163: figured, H. E. Dresser, B. Eur., pts. lxi. & lxii. *C. unwini*, Hume, = pale race of *C. europæus*; W. T. Blanford, Ibis, 1877, pp. 249 & 250.

PODARGIDÆ.

Batrachostomus. Several species discussed; W. T. Blanford, Ibis, 1877, pp. 251-253, and Lord Tweeddale, *tom. cit.* pp. 388-392. A full revision of the genus; Lord Tweeddale, P. Z. S. 1877, p. 420. *B. affinis*, ♀, *B. cornutus*, ♂, *B. stellatus*, ♀, *B. moniliger*, ♂ ♀, figured; *id. l. c.* pls. xlv.-xlix. *B. septimus*, sp. n., *id. l. c.* p. 542, Paganan, Philippine Islands. *B. adpersus*, sp. n., F. Brüggemann, Ann. N. H. (4) xx. p. 178, Central Borneo.

CYPSELIDÆ.

Cypselus sharpii, sp. n., figured; A. Bouvier, Bull. Soc. Z. Fr. i. [1876], p. 228, pl. vi. fig. 1, Banane, W. Africa. *C. toulsoni*, p. 158, Loanda, *finschi*, p. 140, Angola, J. V. B. du Bocage, Orn. Angola, spp. nn.

TROCHILIDÆ.

See ELLIOT, *suprà*, p. 8.

Arimia sophiæ figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iv.

Amalusia, g. n., *id. tom. cit.* p. 15.

Amazilia lucida, sp. n., D. G. Elliot, Ann. N. H. (4) xx. p. 404, Colombia ?.

Calligenia osculans figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iv.

Chatocercus rosæ figured ; *id. op. cit.* iii.

Chrysolampis chlorolema and *C. mosquitus* figured ; *id. op. cit.* iv.

Chrysomirus prasinus figured ; *id. op. cit.* iv.

Doleromia fullax figured ; *id. op. cit.* iii.

Doricha bryante figured ; *id. op. cit.* iii.

Eriocnemis. Description of an apparently new species allied to *E. aurelia*, but no specific name is given ; D. G. Elliot, Bull. Soc. Z. Fr. i. [1876], p. 227, Bolivia.

Euclosia grayi figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iii.

Eulida, g. n. : type, *Calothorax yarrelli*, Gould ; *id. op. cit.* iv. p. 114.

Helianthus taczanowskii, sp. n., A. von Pelzel, Ibis, 1877, pp. 338 & 339, Bogota.

Helionaster constanti figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iv.

Lesbia, g. n. : type, *Trochilus caroli* ; *id. op. cit.* iii. p. 297.

Leucaria, g. n. : type, *Ornismya costæ*, Bourcier ; *id. op. cit.* iv. p. 69.

Manilia, g. n. : type and sole representative, *Calothorax pulchra*, Gould ; *id. op. cit.* iv. p. 30.

Myrmia, g. n. : type, *Calothorax micrurus*, Gould ; *id. op. cit.* iv. p. 113.

Mythina, g. n. : type, *Trochilus (Gouldia) latitæ* ; *id. op. cit.* iii. p. 245.

Ornismya bicolor, D'Orb. & Lafr., = *Thaumantias neglectus*, Elliot ; D. G. Elliot, Ibis, pp. 139 & 140 (descrip.).

Orthorrhynchus emigrans, sp. n., G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 50, Venezuela.

Phæolema rubinoides figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iii.

Panychlora alicæ figured ; *id. op. cit.* iv.

Selasphorus alleni, sp. n., H. W. Henshaw, Bull. Nutt. Orn. Club, ii. p. 53 (with cuts of tail of this species and of that of *S. rufus*), California. Remarks on, with differentiation of *S. henshawi*, sp. n., N. Pacific ; D. G. Elliot, *tom. cit.* p. 97. *S. flammula* figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iii.

Sporadinus bricii, sp. n., G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 50, Isle of New Providence, Bahamas.

Steganura underwoodi figured ; E. Mulsant, Hist. Nat. Ois.-mouches, iii.

Thalurania columbica figured ; *id. op. cit.* iv. *T. wagleri* abundant in Dominica ; G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 4.

Trochilus dorbignii = *Eriocnemis glaucopoides*, D'Orb. & Lafr. ; D. G. Elliot, Ibis, 1877, p. 136.

Urosticte ruficrissus figured ; E. Mulsant, Hist. Nat. Ois.-monches, iii.

Zodalia, g. n. : allied to *Lesbia* ; *id. op. cit.* iii. p. 281.

PASSERES.

PITTIDÆ.

Brachyurus, Thunb. (1821), = *Pitta*, Vieill. (1816); O. Salvin & P. L. Slater, Ibis, 1877, p. 260. *B. propinquus*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 330, Balabac and Mindanao, Philippines. *B. steerii* figured; *id. l. c.* pl. xlix.

Pitta ceruleitorques, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 53, Sanghir Island. *P. palliceps*, sp. n., p. 64, bill figured, pl. iii. figs. 7-10, Sanghir; and *P. kochi*, sp. n., p. 65, bill figured, pl. iii. fig. 6, Luzon: F. Brüggemann, Abh. Ver. Brem. v. *P. ussheri*, sp. n., R. B. Sharpe, P. Z. S. 1877, p. 94, Borneo. Remarks on the genus; G. D. Rowley, Orn. Misc. ii. pp. 261-269, 321-333. *P. rosenbergi* (pl. lxii.), *P. ceruleitorques*, *P. sanghirana* (pls. lxiv. & lxv.), figured; *id. op. cit.* *P. baudii*, *P. gurneyi*, *P. steerii*, *P. ussheri* (pt. xxix.), *P. cerulea*, and *P. cucullata* (pt. xxx.), figured; J. Gould, B. Asia. *P. novæ-guineæ* and *P. rosenbergi* figured; *id. B. New Guinea*, pt. iv.

DENDROCOLAPTIDÆ.

Synallaxis tithys, sp. n., L. Taczanowski, P. Z. S. 1877, p. 323, North Peru.

Synallaxis patagonica and *S. sordida*, nidification of; H. Durnford, Ibis, 1877, pp. 35 & 36.

MELIPHAGIDÆ.

Melidectes torquatus figured; J. Gould, B. of New Guinea, pl. iv.

Melipotés gymnops figured; *id. op. cit.* pl. iv.

Melirrhophetes leucostephes and *M. ochromelas* figured; *id. op. cit.* pl. iv.

Myzomela pammelana, sp. n., P. L. Slater, P. Z. S. 1877, p. 553, Admiralty Islands. *M. coccinea* and *M. erythrina*, spp. nn., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 106, the former from Duke of York Island, the latter from New Zealand. *M. cruentata* figured, J. Gould, B. of New Guinea, pl. v.

Philemon cockerelli, sp. n., P. L. Slater, P. Z. S. 1877, p. 104, New Britain. *P. albitorques*, sp. n., *id. tom. cit.* p. 553, Admiralty Islands.

Ptilotis albo-notata, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 33, Naiabui, New Guinea.

DICEIDÆ.

Dicaeum rubro-coronatum, sp. n., R. B. Sharpe, Nature, xiv. p. 339, Port Moresby, New Guinea. [Omitted from Zool. Rec. xiii.] *D. sanghirense*, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 58, Sanghir Island. *D. eximium*, sp. n., P. L. Slater, P. Z. S. 1877, p. 102; figured, *tom. cit.* pl. xiv. fig. 2, New Ireland. *D. mindanense*, sp. n., Lord Tweed-

dale, P. Z. S. 1877, p. 547, Pasananca, Philippine Islands. *D. cinereigulare*, sp. n., *id. l. c.* p. 829, N. Mindanao, Philippines. *D. xanthopygium*, sp. n., *id. Ann. N. H.* (4) xx. p. 95; *id. P. Z. S.* 1877, p. 698, and figured, pl. lxxiii. fig. 1, Luzon, Philippine Islands. *D. schistaceum* and *D. everetti*, spp. nn., *id. Ann. N. H.* (4) xx. p. 537, ♂, Dinagat, Philippines. *D. dorsalis* figured, J. Gould, B. Asia, pt. xxx.

Prionochilus everetti, sp. n., R. B. Sharpe, Ibis, 1877, p. 16, N. W. Borneo. *P. olivaceus*, sp. n., Lord Tweeddale, *Ann. N. H.* (4) xx. p. 536, ♀, Dinagat, Philippines. *P. quadricolor*, sp. n., *id. P. Z. S.* 1877, p. 762, and figured, pl. lxxvii. fig. 2, Zebu, Philippine Islands. *P. sanghirensis*, sp. n., T. Salvadori, *Ann. Mus. Genov.* ix. p. 59, Sanghir Island.

Zosterops anjuanensis, sp. n., E. Newton, P. Z. S. 1877, p. 297; figured, *id. tom. cit.* pl. xxxiii. fig. 1, Anjuan Island, Comoro Group. *Z. everetti*, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 762, Zebu, Philippine Islands. *Z. (Tephras P.) gulliveri*, sp. n., Castelnau & E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 383, Gulf of Carpentaria. *Z. erythroleurus* figured; David & Oustalet, Ois. Chine, Atlas, pl. xii. *Z. atmorii*, sp. n., R. B. Sharpe, Layard's B. of S. Africa, p. 326, Grahamstown.

NECTARINIIDÆ.

See SALVADORI & SHELLEY, *suprà*, pp. 21 & 24.

Ethopyga flammans, sp. n., Oustalet, J. de l'Inst. 1876, p. 108, Luzon, Philippines. *Æ. waldeni*, sp. n., A. O. Hume, Str. Feath. 1877, p. 51, Mooleyit. *Æ. bella*, sp. n., ♂, Lord Tweeddale, *Ann. N. H.* (4) xx. p. 537, N. Mindanao, Philippines. *Æ. dabryi* figured; David & Oustalet, Ois. Chine, Atlas, pl. xi. *Æ. shelleyi* and *magnifica* figured; G. E. F. Shelley, Mon. Cinnyr. pt. iii.

Anthothreptus griseigularis, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 830, N. Mindanao.

Anthreptes chlorigaster, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 342, Negros, Philippines. *A. xanthochlora*, Hume, = *A. simplex*, ♀; A. O. Hume, Str. Feath. 1877, p. 69. *A. hypogrammica* figured; G. E. Shelley, Mon. Cinnyr. pt. iii.

Arachnothera simillima, sp. n., A. O. Hume, Str. Feath. 1877, p. 487 [no locality given]. *A. dilutior* figured; G. E. Shelley, Mon. Cinnyr. pt. iii.

Chalcostetha insignis figured, *id. op. cit.* pt. iv.

Cinnyris bowieri, Congo (pt. iii.), *C. morotensis*, Morotai Island, and *C. salvadorii* (Jobi Island) (pt. v.), spp. nn.; *id. op. cit.* *C. fuscus*, *C. dussumieri*, *C. cyanolemus*, *C. frenatus*, *C. flammazillaris* (pt. iii.), *C. bifasciatus*, *C. bowieri*, *C. speratus*, *C. minimus*, *C. asiaticus*, *C. porphyrolemus*, *C. sangirensis*, ♂, *C. rhizophora*, *C. andamanicus* (pt. iv.), *C. reichenbachii*, *C. sangirensis*, *C. auriceps*, *C. morotensis*, *C. nigriacapularis*, *C. salvadorii*, *C. proserpina*, *C. aspasioides*, *C. aspasie*, *C. mysorensis*, *C. mafeorensis*, *C. theresae*, *C. lotenius* (pt. v.), figured, *id. op. cit.*

Eudrepanis pulcherrima (pt. iii.) and *E. duyvenbodii* (pt. iv.) figured, *id. op. cit.*

Nectarinia tacaze figured, *id. op. cit.* pt. iv.

Nectarophila julie, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 547, Malanipa, Philippine Islands.

AMPELIDÆ.

Ampelis phænicoptera figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxiv.

Phainoptila, g. n., type *P. melanoxantha*, sp. n., Costa Rica; located for the present near *Ptilogonys*, with which it agrees in wing formula and other points; O. Salvin, P. Z. S. 1877, p. 367.

EURYLEMIDÆ.

Sarcophanops, g. n., R. B. Sharpe, Tr. L. S. (2) i. p. 344; type, *Eurylemus steerii*, ♂ and ♀ of which are figured, pl. liv. Also figured by J. Gould, B. Asia, pt. xxx.

TIMELIIDÆ.

Actinura oghii, sp. n., H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, p. 42, near Saddaya, Assam. *A. ramsayi* figured; W. Ramsey, Ibis, 1877, p. 464, pl. xii.

Alcippe fusca, sp. n., H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, p. 197, Naga Hills. *A. magnirostris*, Wald., believed to be identical with *A. phayrii*, Blyth; A. O. Hume, Str. Feath. 1877, p. 60.

Babax lanceolatus figured; David & Oustalet, Ois. Chine, Atlas, pl. li.

Brachypteryx bustoni, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 367, Sumatra; *id.* Ibis, 1877, p. 308, pl. vi. fig. 2.

Chatorrhea eclipses, sp. n., A. O. Hume, Str. Feath. 1877, p. 337, Punjab.

Cholornis paradoxa figured; David & Oustalet, Ois. Chine, Atlas, pl. lxii.

Cinclosoma lunulatum (pl. liii.), *C. arthemisiae* (pl. liv.), *C. maximum* (pl. lv.) figured; *iid. l. c.*

Dendrobiastes, g. n., allied to *Alcippe*; type, *D. basilanica*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 332, with cut of wing; figured, pl. liii. fig. 1, Basilan, Philippines.

Dryocatataphus tickelli figured; Lord Tweeddale, Ibis, 1877, p. 452, pl. xi. fig. 1, Tenasserim. *D. fulvus*, Walden, its identity with *Trichastoma minor*, Hume, discussed; A. O. Hume, Str. Feath. 1877, p. 59.

Fulvetta, g. n., type, *Alcippe cinereiceps*, Verr., David & Oustalet, Ois. Chine, p. 221; *F. cinereiceps* (pl. lxxiii.), *F. ruficapilla* (pl. lxxii.), *F. striaticollis* (pl. lxxi.), figured, *iid. op. cit.* Atlas.

Garrulax perspicillatus figured; *iid. l. c.* pl. lii.

Heteromorpha gularis, figured; *iid. l. c.* pl. lxi.

Lanthocincla berthemii figured; *iid. l. c.* pl. lx.

Leucodipteron hoamy, new name for *L. sinense*, *iid. op. cit.* p. 189; figured, Atlas, pl. lvi., as *L. chinense*.

Moupinia, g. n., type, *Alcippe pæcillotis*, Verr.; *iid. op. cit.* p. 220.

Macronus striaticeps, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 331, Philippines.

Mixornis woodi, sp. n., *id. ibid.*, Palawan, Philippines.

Mixornis (P) *capitalis*, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 535, Dinagat, Philippine Islands.

Minla jerdoni figured; David & Oustalet, Ois. Chine, Atlas, pl. lxviii.

Neornis albiventris, sp. n., H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, p. 199, Munipur Valley.

Paradoxornis heudei (pl. lxiii.), *P. guttaticollis* (pl. lxiv.), figured; David & Oustalet, Ois. Chine, Atlas.

Pellorneum ignotum, sp. n., A. O. Hume, Str. Feath. 1877, p. 334, Saddy, Assam. *P. pectoralis*, sp. n., H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, p. 41, Saddy, Assam. *P. sub-ochraceum* figured; Lord Tweeddale, Ibis, 1877, p. 452, pl. x. Karen Hills. *P. tickelli*, Blyth, appears to belong to *Drymocapus*; *id. l. c.*

Philocichla, g. n., allied to *Turdinus*, type, *P. falcata*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 332, figured, pl. l. fig. 3, Palawan, Philippines.

Pycnorhhis griseigularis, sp. n., A. O. Hume, Str. Feath. 1877, p. 116, Bhootan Doars. *P. altirostris* obtained in Sind; W. T. Blanford, *tom. cit.* p. 245. *P. altirostris* figured; H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, pl. ix.

Sibia desgodinsi, sp. n., E. Oustalet & A. David, Bull. Soc. Phil. Paris (7) i. p. 139, Upper Mekong, China.

Sphenocichla roberti figured; H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, pl. vi.

Trichostoma abbotti figured; Lord Tweeddale, Ibis, 1877, pl. xi. fig. 2. *T. leucoproctum*, sp. n., *id.* P. Z. S. 1877, p. 366, Tenasserim.

Trochalopteron ellioti (pl. lvii.), *T. mitnii* (p. lviii.), *T. formosum* (pl. lix.), figured; David & Oustalet, Ois. Chine, Atlas. *T. fairbanki*, on the Palani Hills; S. B. Fairbank, Str. Feath. 1877, p. 404.

Turdinus nagaensis, sp. n., H. H. Godwin-Austen, Ann. N. H. (4) xx. p. 519, Eastern Naga Hills. *T. crispifrons*, remarks on; A. O. Hume, Str. Feath. 1877, p. 87.

HIRUNDINIDÆ.

Cecropis archetes, sp. n., A. O. Hume, Str. Feath. 1877, p. 266, Malay Peninsula.

Hirundo nigro-rufa, sp. n., J. V. B. du Bocage, J. Sc. Lisb. xxi. p. 158, Angola.

Lillia: remarks on some species of this subgenus; A. O. Hume, Str. Feath. 1877, p. 254. *L. intermedia* (East Assam), and *L. substriolata* (Cachar), spp. nn., *id. tom. cit.* pp. 263 & 264.

TYRANNIDÆ.

Elainea leucospodia, sp. n., L. Taczanowski, P. Z. S. 1877, p. 325, Tumbez, Peru.

Myiarchus oberi, sp. n., G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 4, Island of Dominica.

Myiodynastes luteiventris, ♂ figured, H. W. Henshaw, in Wheeler's Rep. Geogr. Surv. pl. xiv.

Ochthoeca leucometopa, sp. n., Peru, and *O. arenacea*, sp. n., Columbia, P. L. Selater & O. Salvin, P. Z. S. 1877, p. 20. *O. salvini*, sp. n., L. Taczanowski, *tom. cit.* p. 324, North Peru.

Phyllomias tumbezana, *id. l. c.* p. 325, North Peru.

Pyrocephalus nanus occurs in Charles Island, Galapagos; R. B. Sharpe, *tom. cit.* p. 66.

Todirostrum rufigene, sp. n., P. L. Selater & O. Salvin, *tom. cit.* p. 522, Mongi, Ecuador.

COTINGIDÆ.

Lathria cryptolopha, sp. n., *iid. ibid.* Ecuador.!

FORMICARIIDÆ.

Grallaria. List of known species, p. 437; *G. haplonota*, sp. n., p. 442, Venezuela; *G. flavo-tincta*, sp. n., Huasampilla, Upper Peru, figured, p. 445, pl. ix.; *G. ruficeps* figured, pl. viii.: P. L. Selater, Ibis, 1877.

LANIIDÆ.

Bradyornis woodwardi, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iii. p. 311, pl. xiv., Natal. *B. diabolicus*, a new name for *B. pammelaena*; *id. l. c.* p. 314.

Collyriocincla pallidirostris, sp. n., *id. l. c.* p. 293, Northern Australia.

Dryoscopus neglectus, sp. n., differentiated from *D. major*, J. V. B. du Bocage, Orn. Angola, i. p. 230, Quillengues, Gambos, Humbe, Cunene, and Lake Ngami.

Dryoscopus tricolor, sp. n., J. Cabanis & A. Reichenow, J. f. O. 1877, p. 103, Loango.

Eopsaltria (?) *brunnea*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 391, Port Moresby, New Guinea.

Lanius isabellinus, H. & E., obtained on Heligoland, H. Seebohm, Ibis, 1877, pp. 163 & 164. *L. phenicurus*, Pallas, remarks on its identification; J. Vian, Bull. Soc. Z. Fr. ii. p. 208. *L. phenicuroides*, Severtz., distinct from *L. isabellinus*, H. & E.; H. Schalow, Ibis, 1877, p. 398. *L. schah* (pl. lxxv.), *L. phenocercus* (pl. lxxvi.), figured; David & Oustalet, Ois. Chine, Atlas.

Melanorectes, g. n., type *Rectes nigrescens*, Schl.; R. B. Sharpe, *l. c.* pp. 271 & 289.

Muscitrea cyanea, sp. n., A. O. Hume, Str. Feath. 1877, p. 101, Ramree.

Pachycephala occidentalis, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 212, Western Australia, distinguished from *P. gutturalis*. *P. torquata*, figured; G. D. Rowley, Orn. Misc. ii. pl. lxxiv.

Pinarolestes [in error *Myiolestes*] *macrorrhynchus*, Lay., figured; G. D. Rowley, Orn. Misc. ii. pl. lxxiii. *Pinarolestes*, g. n. (type *Myiolestes vitensis*) = *Myiolestes* auctt. recentt., nec Cabanis; R. B. Sharpe, Cat. Birds B. M. pp. 271 & 293.

Pseudorectes, g. n., contains *Rectes ferrugineus* and *R. leucorrhynchus* R. B. Sharpe, l. c. pp. 271 & 287.

Rectes aruensis, sp. n., *id. op. cit.* p. 285, Aru Islands.

Rectes tibialis, sp. n., differentiated from *R. uropygialis*; *id. op. cit.* p. 285, New Guinea.

Telephonus anchietæ, figured; J. V. B. du Bocage, Orn. Angola, i. pl. iv.

CAMPEPHAGIDÆ.

Graucalus angustifrons, sp. n., R. B. Sharpe, J. L. S. xiii. p. 81, S. E. New Guinea.

Volvocivora neglecta and *V. intermedia*, spp. nn., Tenasserim, with remarks on the genus; A. O. Hume, Str. Feath. 1877, pp. 203-207.

DICRURIDÆ.

See SHARPE, *suprà*, p. 23.

Buchanga insularis, sub-sp. n. of *B. cærulescens*, and = *B. cærulescens*, Holdsw., Ceylon; R. B. Sharpe, Cat. B. Brit. Mus. p. 253. *B. leucogenys*, figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxvii.

Chætorrhynchus papuensis, Meyer, figured; R. B. Sharpe, Cat. Brit. Mus. pl. xiii.

Dicrurus læmo-stictus, sp. n., P. L. Sclater, P. Z. S. 1877, p. 101, New Britain. *D. striatus*, sp. n., differentiated from *D. balicassius*, Lord Tweeddale, *tom. cit.* p. 545, Pasananca, Philippine Islands.

Irena melanochlamys, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iii. p. 266, figured, Tr. L. S. (2) pl. li. fig. 2, Island of Basilan, Philippines. *I. criniger*, sp. n., Sumatra and Borneo, differentiated from *I. puella* and *I. turcosa*, *id. tom. cit.* p. 267. *I. tweeddalii*, sp. n., *id. tom. cit.* p. 268, figured, *id.* Tr. L. S. (2) pl. li. fig. 1, Island of Balabac, Philippines.

MUSCICAPIDÆ.

Cyanoptila cyanomelena, figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxxi.

Cyornis turcosa, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 457, Borneo. *C. olivacea*, sp. n., A. O. Hume, Str. Feath. 1877, p. 338, Tenasserim. *C. albo-olivacea*, sp. n., *id. tom. cit.* p. 488, Malacca. *C. philippinensis*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 325, Panay, Philippines (distinguished from *C. banyumas*, Wald., by its white belly and under tail coverts).

Elminia albicauda, sp. n., J. V. B. du Bocage, J. Sci. Lisb. xxi. p. 159, Angola.

Erythrøsterna albicilla figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxix. *E. parva* obtained as far east as the Bhotan Doovars; W. T. Blanford, Str. Feath. 1877, p. 485.

Eumyias panayensis, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 326, Panay.

Hypothymis celestis, sp. n., ♀, Lord Tweeddale, Ann. N. H. (4) xx. p. 536, Dinagat, Philippines. *H. superciliaris*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 326, Basilan.

Monarcha commutata, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 68, Celebes. *M. verticalis*, sp. n., differentiated from *M. loricata*, and figured; P. L. Selator, P. Z. S. 1877, p. 99, pl. xiv. fig. 1, Duke of York Island. *M. melanotus*, sp. n., New Guinea, differentiated from *M. chrysomelas*; id. tom. cit. p. 100. *M. infelix*, sp. n., id. tom. cit. p. 552, Admiralty Islands. *M. kordensis* and *M. melanota*, figured; J. Gould, B. New Guinea, pt. v.

Machærorhynchus albifrons and *M. nigripectus*, figured; id. op. cit. pt. iv.

Niltava leucura, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 95, Tenasserim.

Pericocotus: remarks on the genus, and description of *P. neglectus* and *P. immodestus*, spp. nn., Tenasserim; A. O. Hume, Str. Feath. 1877, pp. 171-198. *P. brevirostris*, figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxviii.

Philentoma albiventris, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 325, Guimaras, Philippines.

Platystira minulla, figured; J. V. B. du Bocage, Orn. Angola, pt. i. pl. iii.

Rhipidura fuscescens, sp. n., J. Cabanis & A. Reichenow, J. f. O. 1876, p. 319, New Guinea. *R. semirubra*, sp. n., P. L. Selator, P. Z. S. 1877, p. 552, Admiralty Islands. *R. albo-gularis*, vel *R. albicollis*, Layard, P. Z. S. 1875, pp. 29 & 434, and Ibis, 1876, p. 149, renamed *layardi*; T. Salvadori, Ibis, 1877, p. 143.

Setaria ruficauda, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 327, Basilan.

Tchitrea vulpina, sp. n., differentiated from *T. mutata*, E. Newton, P. Z. S. 1877, p. 298; pl. xxxiii. fig. 2, Anjuan Island, Comoro group. *T. incii*, figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxxii.

Xantholestes, g. n., replacing *Myiolestes*, R. B. Sharpe, Tr. L. S. (2) i. p. 327; *X. panayensis*, sp. n., id. *ibid.*, Panay.

Xanthopygia tricolor, figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxx.

Zeocephus cinnamomeus and *Z. cyanescens*, spp. nn., R. B. Sharpe, Tr. L. S. (2) i. p. 328, pl. xlvi. figs. 1 & 2, Philippines.

EUPETIDÆ.

Eupetes nigririssus, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 36, New Guinea.

ORIOLIDÆ.

See SHARPE, *suprà*, p. 23.

Broderipus [Oriolus] formosus, figured; G. D. Rowley, Orn. Misc. ii. pl. lvi.

Oriolus assimilis, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 760, pl. lxxvi., Zebu, Philippine Islands. *O. chinensis* figured; J. Gould, B. Asia, pt. xxx. *O. diffusus*, a new name for the species hitherto known as *O. chinensis* and *O. indicus*; R. B. Sharpe, Cat. B. Brit. Mus. iii. 1877. [VOL. XIV.]

p. 198. *O. suluensis*, a new name for a sub-sp. of *O. frontalis*, Wall. ; *id. tom. cit.* p. 205. *O. steerii*, sp. n., Philippine Islands, *id. tom. cit.* p. 213, pl. x. *O. viridifuscus* (Heine), Timor group, figured ; *id. tom. cit.* pl. xi. *Sphæcotheres salvadorii*, sp. n. ; *id. tom. cit.* p. 224, pl. xii., S. E. New Guinea.

PYCNONOTIDÆ.

Ægithina viridissima, figured ; Lord Tweeddale, Ibis, 1877, p. 304, pl. v. *Crateropus hypostictus*, sp. n., J. Cabanis & A. Reichenow, J. f. O. 1877, p. 103, Loango.

Crateropus hartlaubi and *C. gutturalis*, figured ; J. V. B. du Bocage, Orn. Angola, i. pl. i. figs. 1 & 2.

Criniger everetti, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 535, N. Mindanao ; *id.* P. Z. S. 1877, p. 827, pl. lxxxiv. *C. frater*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 334, Palawan.

Hemizus davisoni, sp. n., A. O. Hume, Str. Feath. 1877, p. 111, Myawadee.

Hypsipetes subniger, sp. n., *id. tom. cit.* p. 109, Tenasserim. *H. rustularis*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 335, Basilan. *H. leucocephalus* figured ; David & Oustalet, Ois. Chine, Atlas, pl. 44.

Ixus xanthorrhous (pl. xlv.) *I. chrysorrhoides* (pl. xlvi.) figured ; David & Oustalet, Ois. Chine, Atlas. *I. hainanus* occurs in Siam ; R. Swinhoe, Ibis, 1877, p. 128.

Iora, remarks on the genus ; A. O. Hume, Str. Feath. 1877, p. 420.

Poliolophus, g. n., for *Ixus urostictus*, Salvad. ; R. B. Sharpe, Tr. L. S. (2) i. p. 334.

Phyllornis flavipennis, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 761, and figured, pl. lxxvii. fig. 1, Zebu, Philippine Islands. *P. viridinucha*, sp. n., R. B. Sharpe, Ibis, 1877, p. 15, Borneo. *P. palawanensis*, sp. n., *id.*, Tr. L. S. (2) i. p. 333, pl. l. figs. 1 & 2, Palawan.

Pomatorrhinus nuchalis, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 535, Karen Hills, Burma. *P. inglisi*, sp. n., A. O. Hume, Str. Feath. 1877, p. 31, Cachar. *P. tickelli*, sp. n., *id. tom. cit.* p. 32, Mooleyit. *P. hypoleucus*, var., Blyth, = *P. tickelli*, Hume ; H. H. Godwin-Austen, P. A. S. B. 1877, p. 147. *P. steno[rhynchus]*, sp. n., *id.* J. A. S. B. xlv. pt. 2, p. 43, near Saddya, Assam. *P. ochraceiceps* figured ; W. Ramsay, Ibis, 1877, p. 465, pl. xiii. *P. swinhoi* (pl. xlviii.), *P. gravivox* (pl. xlix.), figured ; David & Oustalet, Ois. Chine, Atlas.

Pterorrhinus davidi figured ; David & Oustalet, l. c. pl. l.

Pycnonotus stictocephalus, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 34, Naiabui, New Guinea.

Spizixus semitorques figured ; David & Oustalet, l. c. pl. xlvii.

TURDIDÆ.

Cittocinclia nigra, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 335, pl. lii. figs. 1 & 2, Palawan, Philippines.

Geocichla layardi, exhibition of a second specimen, believed to be ♀

of this rare bird, from Ceylon; E. W. H. Holdsworth, P. Z. S. 1877 p. 160.

Merula kessleri obtained in Tibet; W. T. Blanford, Str. Feath. 1877, p. 484.

Mesites considered to be an aberrant form of the Ardeine group; E. Bartlett, P. Z. S. 1877, p. 292.

Monticola pandoo obtained in Borneo; R. B. Sharpe, Ibis, 1877, p. 13.

Merula gouldi figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxix.

Monticola solitarius (pl. xli.), *M. gularis* (pl. xlii.), figured; *ibid.* l. c.

Myiophoneus ceruleus figured; *ibid.* l. c. pl. xliii.

Oreocincla varia, nest and eggs described and figured; R. Swinhoe, Orn. Misc. ii. p. 256, pl. lxi., Ningpo. *O. mollissima*, figured; David & Oustalet, Ois. Chine, Atlas, pl. xl.

Turdulus davisoni, sp. n., A. O. Hume, Str. Feath. 1877, p. 63, Mooleyit, Tenasserim; proves to = *Turdus sibiricus*, ♂ ad. *ibid.* tom cit. p. 136.

Turdus bewsheri, sp. n., E. Newton, P. Z. S. 1877, p. 299; pl. xxxiv., Anjuan Island, Comoro Group. *T. leucops*, sp. n., differentiated from *T. serranus*, Tsch., L. Taczanowski, P. Z. S. 1877, p. 331, Central Peru. *T. atrigularis* (pts. lix. & lx.), *T. dubius*, *T. naumanni*, and *T. ruficollis* (pts. lvii. & lviii.) figured; H. E. Dresser, B. Eur. *T. migratorius*, its occurrence at Dover; J. E. Harting, Zool. 1877, p. 14.

SYLVIIDÆ.

Abrornis fulvifacies, figured; David & Oustalet, Ois. Chine, Atlas, pl. xxiii.

Accentor immaculatus (pl. xxxii.) and *A. montanellus* (pl. xxxiii.), figured; *ibid.* l. c.

Acrocephalus, remarks on; W. E. Brooks, Ibis, 1877, p. 397. *A. fulvo-lateralis*, sp. n., R. B. Sharpe, Layard's B. S. Afr. p. 289, Natal. *A. palustris*, with nest and eggs obtained near Taunton; M. A. Mathew, Zool. 1877, p. 333.

Apalis cerviniventris, sp. n., R. B. Sharpe, P. Z. S. 1877, p. 22, Gold Coast.

Arundinax davidianus, figured; David & Oustalet, Ois. Chine, Atlas, pl. xx.

Bæocerca flaviventris, sp. n., R. B. Sharpe, P. Z. S. 1877, p. 23, pl. ii. fig. 1, Gold Coast.

Bradypterus rufescens, sp. n., R. B. Sharpe & A. Bouvier, Bull. Soc. Z. Fr. i. [1876] p. 307, Landana, W. Africa.

Calamoherpe agricola described from Astrachan; J. Vian, Bull. Soc. Z. Fr. ii. [1877] p. 117.

Callene albiventris obtained in the Palani Hills; S. B. Fairbank, Str. Feath. 1877, p. 402.

Chemarrornis leucocephala figured; David & Oustalet, Ois. Chine, pl. xxiv.

Chatops aurantius, figured; R. B. Sharpe, Layard's B. S. Afr. pl. vi.

Cisticola, on the Indian species of the genus; A. O. Home, Str. Feath. 1877, p. 90. *C. cursitans* figured; H. E. Dresser, B. Eur. pts. lxi. & lxii.

Cisticola landanae, sp. n., A. Bouvier, Bull. Soc. Z. Fr. i. [1876] p. 228, Landana, W. Africa.

Drymæca angolensis, sp. n., J. V. B. du Bocage, J. Sc. Lisb. xxi. p. 160, Angola. *D. hypoxantha*, sp. n., R. B. Sharpe, Layard's B. S. Afr. p. 260, Natal.

Dromæocercus, g. n., allied to *Phleaxis*; type, *D. brunneus*, sp. n., *id.* P. Z. S. 1877, p. 23, pl. ii. fig. 2, Madagascar.

Ellisia longicaudata, sp. n., distinguished from *E. typica*, E. Newton, P. Z. S. 1877, p. 299, Anjuan Island, Comoro group. *E. sechellensis*, sp. n., E. Oustalet, Bull. Soc. Philom. Paris, (7) i. p. 102, Marianna, Seychelle Islands.

Gerygonè cinerascens, sp. n., R. B. Sharpe, J. L. S. xiii. p. 494, S. E. New Guinea. *G. flavida*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. ii. p. 53, Herbert River, N. S. W. *G. superciliosa*, Wallace, = *Ph. presbytis*, Seeböhm, Ibis, 1877, pp. 83 & 84. *P. brooksi*, Hume, = *P. schwarzi*, *id. tom. cit.* p. 84. *P. brehmi*, Homeyer, = *P. collybita*, *id. tom. cit.* p. 96.

Grandala calicolor figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxi.

Herbivocula incerta, sp. n., *id. tom. cit.* p. 246, Pekin.

Hodgsonius phenicuroides figured; *id. op. cit.* Atlas, pl. xxx.

Moreites brunneifrons figured; *id. op. cit.* pl. xvii.

Ianthia cyanura figured; *id. op. cit.* pl. xxviii.

Lamprolia minor differentiated from *L. victoriæ*; T. Salvadori, Ibis, 1877, pp. 143 & 144.

Larivora cyane figured: David & Oustalet, Ois. Chine, Atlas, pl. xxvii.

Locustella, rectification of synonymy of several species; H. Seeböhm, P. Z. S. 1877, p. 806. *L. minor*, sp. n., David & Oustalet, Ois. Chine, p. 250, Pekin.

Malurus albo-scapulatus figured; J. Gould, B. New Guinea, pt. iv.

Megalurus ruficeps, sp. n., Lord Tweeddale, Ann. N. H. (4) vol. xx. p. 94; *id.* P. Z. S. 1877, p. 695, figured, pl. lxxii., Luzon, Philippines.

Oreopneuste affinis, sp. n., David & Oustalet, Ois. Chine, p. 267, Moupin and Eastern Sechuan; *O. armandi* figured, *id.* Atlas, pl. xxii.

Orthotomus frontalis and *O. cinereiceps*, Philippines, described and figured; R. B. Sharpe, Ibis, 1877, pp. 112 & 113, pl. ii. figs. 1 & 2. *O. borneonensis*, Salv., = ad. ♂ of *O. cineraceus*, Blyth; *id. tom. cit.* p. 114. *O. maculicollis*, F. Moore, redescribed; *id. tom. cit.* p. 116. *O. nigriceps*, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 828, and ♂ figured, pl. lxxxv. Surigao, Philippines.

Pratincola jamesoni, proposed as a new name for *P. rubetraoides*, with remarks on the Indian species of the sub-genus; A. O. Hume, Str. Feath. 1877, p. 239. *P. rubicola*, on its migrations; J. Cordeaux, Tr. Norw. Soc. 1876-77, p. 264.

Philothamna minor described and figured; M. T. v. Heuglin, Reise in Nord-ost Afrika, ii. p. 182, pl. [Appears to have been originally described in Ber. der xxi. Vers. Deutsch. Ornith. 1875, p. 93.]

Phylloscopus. A monographical revision of the genus, of which

the author admits 32 species; H. Seebohm, *Ibis*, 1877, pp. 66-108. *P. seebohmi*, sp. n., A. O. Hume, *Str. Feath.* 1877, p. 335, Tavoy. *P. trochilus* and *P. tristis* occur on the Ob; O. Finsch, *Ibis*, 1877, p. 56. *P. trochilus* as far as Yenisei; H. Théel, *Rapport*, p. 50. *P. middendorfi* = *P. viridamus*, Blyth; W. E. Brooks, *Ibis*, 1877, p. 396. *P. sibilatrix* obtained at Laurvig, Norway; R. Collett, *Förh. Selsk. Chr.* 1877, No. 5, p. 3. *P. borealis*, remarks on its occurrence and habits in Norway; R. Collett, *P. Z. S.* 1877, p. 43. *P. gætkii*, new name proposed for *P. major*, Tristram, *nec* Forster; H. Seebohm, *Ibis*, 1877, p. 92.

Prinia rafflesi, sp. n., Sumatra, described and figured, Lord Tweeddale, *Ibis*, 1877, p. 311, pl. vi. fig. 1.

Reguloides viridipennis, Blyth: Seebohm's identification criticised; A. O. Hume, *Str. Feath.* 1877, p. 330.

Rhopophilus pekinensis figured; David & Oustalet, *Ois. Chine*, Atlas, pl. xix.

Ruticilla mesoleuca has occurred in Heligoland; H. Seebohm, *Ibis*, 1877, p. 163. *R. fuliginosa* (pl. xxv.), *R. aurea* (pl. xxvi.), figured; David & Oustalet, *Ois. Chine*, Atlas.

Salicaria: Severtzoff's Turkestan species identified, and referred to gen. *Acrocephalus* and *Hypolais*; H. Seebohm, *Ibis*, 1877, p. 151. *S. fluvialis*, its nest and eggs; H. Fournes, *Mitt. Orn. Ver. Wien*, 1877, p. 51.

Savicola shelleyi (Victoria Falls) and *S. andersonni* (Damara-land), spp. nn., described; R. B. Sharpe, *Layard's B. S. Afr.* pp. 246 & 249. *S. tephronota*, sp. n., J. H. Gurney, in Note to T. Ayres on Ornith. of Transvaal, *Ibis*, 1877, p. 343. *S. ænanthe*, remarks on; G. D. Rowley, *Orn. Misc.* ii. p. 397. Letter on the specific value of the large race of; Lord Clifton, *Ibis*, 1877, p. 256.

Sphenæacus macrurus, sp. n., T. Salvadori, *Ann. Mus. Genov.* ix. p. 35, Naiabui, New Guinea.

Suya parum-striata, sp. n., David & Oustalet, *Ois. Chine*, i. p. 259, Fokien. *S. striata*, figured; *id. op. cit.* Atlas, pl. xviii.

Sylvietta ruficapilla, sp. n., J. V. B. du Bocage, *J. Sci. Lisb.* xxi. p. 160, Angola.

Tarsiger chrysæus figured; David & Oustalet, *Ois. Chine*, Atlas, pl. xxix.

Tribura luteiventris figured; *id. op. cit.* pl. xxi.

MNIOTILTIDÆ.

Basileuterus castaneiceps, sp. n., P. L. Sclater & O. Salvin, *P. Z. S.* 1877, p. 521, Ecuador.

Dendroica plumbea, sp. n., G. N. Lawrence, *Ann. N. Y. Ac. Sc.* i. p. 4, Island of Dominica. *D. auduboni*, nest and eggs described; T. M. Brewer, *Ibis*, 1877, p. 394, Upper Colorado.

Helminthophaga lawrencii, capture of a second specimen; H. Herrick, *Bull. Nutt. Orn. Club*, ii. p. 19, New Jersey.

MOTACILLIDÆ.

Anthus seebohmii, Dresser, = *A. gustavi*, Swinhoe; H. Seebohm, Ibis, 1877, pp. 128 & 129. *A. gustavi* has occurred in Celebes; Lord Tweeddale, Ibis, 1877, p. 258 [cf. Tr. Z. S. viii. p. 117]. *A. blakistoni*, Swinhoe, = *A. neglectus*, Brooks; W. E. Brooks, Ibis, 1877, pp. 206 & 207. *A. obscurus* figured; H. E. Dresser, B. Eur. pls. lvii. & lviii.

Corydalla kiangsinsensis, sp. n., David & Oustalet, Ois. Chine, p. 311, Kiangsi; figured, Atlas, pl. xxxvii.

Ephthianura crocea, sp. n., Castelnau & E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 380, Gulf of Carpentaria.

Henicurus sinensis figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxviii.

Motacilla melanope, Pall., obtained at Bergen, Norway, R. Collett, Förh. Selsk. Chr. 1877, No. 5, p. 1.

Siurus: corrections of nomenclature of this genus; E. Coues, Bull. Nutt. Orn. Club. ii. p. 29.

TROGLODYTIDÆ.

Spelæornis, g. n., type *Pnoepyga troglodytoides*, Verr.; David & Oustalet, Ois. Chine, p. 228. *S. troglodytoides* (pl. xvi.), *S. halsueti* (pl. xv.), figured; op. cit. Atlas.

Thryothorus rufescens, sp. n., G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 46 et seq., Island of Dominica. *T. bewicki*, var. *leucogaster*, figured; H. W. Henshaw, in Wheeler's Rep. Geogr. Surv. v. pl. i. fig. 1.

Urosphena, g. n., type, *Tribura squamiceps*; R. Swinhoe, Ibis, 1877, pp. 203-205, pl. iv.

CERTHIIDÆ.

Certhiinae: remarks on the Indian species; A. O. Hume, Str. Feath. 1877, p. 73.

Certhia himalayana figured; David & Oustalet, Ois. Chine, Atlas, pl. xiv.

SITTIDÆ.

Dendrophila enochlamys, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 338, pl. liii. fig. 3, Guimaras, Philippines.

Sitta villosa figured; David & Oustalet, Ois. Chine, Atlas, pl. xiii.

Sittella albata, sp. n., E. P. Ramsay, P. Z. S. 1877, p. 351, Port Denison.

PARIDÆ.

Ægithalus flammeiceps figured; J. Gould, B. Asia, pt. xxx.

Alotrius intermedius, sp. n., A. O. Hume, Str. Feath. 1877, p. 115, Tenasserim.

Anthipes submoniliger, sp. n., *id. l. c.* p. 105, Tenasserim.

Chleuasicus ruficeps, Blyth, var. n. *atro-superciliaris*, H. H. Godwin-Austen, P. A. S. B. 1877, p. 147, Sadiya, Upper Assam.

Iculus humilis and *I. rufigenis*, spp. nn., A. O. Hume, Str. Feath. 1877, p. 106, Tenasserim.

Liothrix luteus figured; David & Oustalet, Ois. Chine, Atlas, pl. lxvii.

Lioptila davisoni, sp. n., A. O. Hume, Str. Feath. 1877, p. 110, Moolyit.

Liocichla, g. n., R. Swinhoe, Ibis, 1877, p. 473; allied to *Liothrix*, but with stronger legs and shorter wings; type, *L. steerii*, sp. n., *l. c.* p. 474, pl. xiv., Formosa.

Machlolophus rex figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxvi.

Parus amabilis, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 338, pl. liii. fig. 2, Balabac, Philippines. *P. rufiventris*, sp. n., J. V. B. du Bocage, J. Sc. Lisb. xxi. p. 161, Angola. *P. (Cyanistes) pleskii*, sp. n., J. Cabanis, J. f. O. 1877, p. 213, pl. iii. fig. 1, St. Petersburg. *P. pekinensis* figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxiv. *P. arfaki* figured; J. Gould, B. New Guinea, pt. iv. *P. elegans* figured; J. Gould, B. Asia, pt. xxx.

Proparus swinhoei figured; David & Oustalet, Ois. Chine, Atlas, pl. xxxv.

Siva castanicauda and *S. sordida*, spp. nn., A. O. Hume, Str. Feath. 1877, pp. 100 & 104, Tenasserim.

Staphida plumbeiceps, sp. n., H. H. Godwin-Austen, Ann. N. H. (4) xx. p. 519, Eastern Assam.

Suthora conspiciata (pl. lxv.), *S. cyanophrys* (pl. lxvi.), figured; David & Oustalet, Ois. Chine, Atlas.

Suthora munipurensis figured; J. Gould, B. Asia, pt. xxix.

Yuhina diademata (pl. lxix.), *Y. nigrimentum* (pl. lxx.), figured; David & Oustalet, Ois. Chine, Atlas.

FRINGILLIDÆ.

Carduelis orientalis figured; J. Gould, B. Asia, pt. xxx.

Carpodacus rubicilla obtained in Tibet; W. T. Blanford, Str. Feath. 1877, p. 485. *C. erythrurus* and *C. githagineus* obtained at Malaga, Spain; H. Saunders, Bull. Soc. Z. Fr. ii. p. 95. *C. sinaiticus* figured; H. E. Dresser, B. Eur. pts. lvii. & lviii.

Eophona personata (pl. xci.), *E. melanura* (pl. xcii.), figured; David & Oustalet, Ois. Chine, Atlas.

Erythropsiza obsoleta and *E. incarnata* figured; J. Gould, B. Asia, pt. xxix. *E. mongolica* figured; David & Oustalet, Ois. Chine, Atlas, pl. xcvi.

Geospiza fuliginosa occurs in Albemarle Island, Galapagos; R. B. Sharpe, P. Z. S. 1877, p. 66.

Gnathospiza, g. n., type, *G. raimondii*, sp. n.; L. Taczanowski, P. Z. S. 1877, p. 320, pl. xxxvi. fig. 1, Tumbes, Peru.

Hæmophila stolzmanni, sp. n., *id. tom. cit.* p. 322, pl. xxxvi. fig. 2, Tumbes, Peru.

Leucosticte: remarks on the genus; R. Ridgway, "Field and Forest," ii. Sept., 1876. *L. brunneinucha* figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxxix.

Linota rufescens, *L. linaria*, and *L. exilipes*, figured; H. E. Dresser, B. Europe, pts. lvii. & lviii.

Loxia leucoptera and *L. bifasciata* figured; *id. op. cit.* pts. lxiii. & lxiv.

Loxioides bailleui, g. & sp. n., E. Oustalet, Bull. Soc. Philom. Paris (7) i. pp. 99 & 100, Sandwich Islands.

Passer hispaniolensis, *P. domesticus*, and *P. montanus*: notes on their breeding; L. Bureau, Bull. Soc. Z. Fr. i. [1876] p. 191.

Petronia stulta and *P. brachyductyla* figured; H. E. Dresser, B. Eur., pts. lix. & lx.

Pheucticus crissalis, sp. n., P. L. Selater & O. Salvin, P. Z. S. 1877, p. 19, Ecuador.

Propasser trifasciatus (pl. xciii.), *P. davidianus* (pl. xciv.), *P. edwardsi* (pl. xciv.), *P. vinaceus* (pl. xcvi.), figured; David & Oustalet, Ois. Chine, Atlas.

Pyrgilauda davidiana figured; *id. op. cit.* pl. xc.

Rhodopechys sanguinea figured; J. Gould, B. Asia, pt. xxix.

Serinus canarius figured; H. E. Dresser, B. Eur., pts. lxiii. & lxiv.

Uragus lepidus, sp. n., David & Oustalet, Ois. Chine, p. 359, figured, Atlas, p. 98, Mountains of Tsinling.

Zonotrichia: observations on the genus, and *Z. canicapilla* and *Z. strigiceps* figured; P. L. Selater, Ibis, 1877, pp. 46-48, pl. i.

TANAGRIDÆ.

Calliste albertina, sp. n., A. von Pelzeln, Ibis, 1877, p. 337, River Madeira, Brazil.

Chlorospingus phæocephalus, *id. tom. cit.* p. 521, pl. lii. fig. 2, Ecuador.

Euphonia finschi, p. 19, Demerara, and *E. insignis*, p. 521, pl. lii. fig. 1, Ecuador, P. L. Selater & O. Salvin, P. Z. S. 1877, spp. nn.

Pyrranga æstiva, var. *cooperi*, ♂ ♀, figured; H. W. Henshaw, in Wheeler's Rep. Geogr. Surv. v. pls. ii. & iii.

PLOCEIDÆ.

Donacola nigriceps, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 392, Port Moresby, New Guinea.

Munia caniceps, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 38, Naiaibui, New Guinea. *M. inglisi*, sp. n., A. O. Hume, Str. Feath. 1877, p. 39, Cachar.

Ocyrcerca everetti, sp. n., Lord Tweeddale, Ann. N. H. (4) xx. p. 96; *id.*, P. Z. S. 1877, p. 699, pl. lxxiii. fig. 2, Luzon, Philippine Islands.

Ploceus russi, sp. n., O. Finsch, Die gefiederte Welt, No. 31, West Africa.

Poephila gouldia: on a species supposed to be distinct, although closely allied to both this and *P. mirabilis*; E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 197, Rockingham Bay; *P. mirabilis*, ♀, *id. tom. cit.* p. 281, their specific distinction further discussed, *id. op. cit.* ii. p. 70. *P. atropygialis*, sp. n., Castelnau & E. P. Ramsay, P. Linn. Soc. N. S. W. i. p. 382, Gulf of Carpentaria.

Pytelia wieneri, Russ. [*sic*], sp. n., O. Finsch, Die gefiederte Welt, No. 32, Australia?.

Sycobius albinucha, sp. n., J. V. B. du Bocage, J. Sc. Lisb. xxi. p. 246, West Africa.

EMBERIZIDÆ.

Emberiza cirius and *Passerina* [*Emberiza*] *melanocephala*. Notes on the assumption of ♂ plumage by ♀; L. Bureau, Bull. Soc. Z. ii. p. 23.

Emberiza rustica and *E. pusilla* figured; H. E. Dresser, B. Eur. pts. lxi. & lxii.

ALAUDIDÆ.

Calandrella, review of the Russian species of this genus; M. Bogdanow, J. f. O. 1877, p. 91.

Certhilauda duponti obtained at Malaga, Spain; H. Saunders, Bull. Soc. Z. Fr. ii. p. 91.

Melanocorypha mongolica figured; David & Oustalet, Ois. Chino, Atlas, pl. lxxxviii.

STURNIDÆ.

Acridotheres albo-cincta figured; H. H. Godwin-Austen, J. A. S. B. pt. 2, xlv. pl. v. *A. cristatellus* figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxxvi.

Calornis, sp. inc., P. L. Selater, P. Z. S. 1877, p. 554, Admiralty Islands [cf. Tweeddale, Tr. Z. S. viii. p. 79, and Sharpe, Ibis, 1876, p. 76]. *C. sanghirensis*, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 60, Sanghir Island.

Gracula gnathoptila, sp. n., J. Cabanis & A. Reichenow, SB. nat. Fr. 1876, p. 72, New Hanover.

Lamprocolius glauco-virens, sp. n., D. G. Elliot, Ann. N. H. (4) xx. p. 169, Gaboon.

Mino robertsoni, sp. n., M. L. D'Albertis, Ibis, 1877, p. 368 (= *Melanopyrrhus orientalis*; T. Salvadori, Ann. Mus. Genov. x. p. 12).

Pastor roseus: its route from Austria and Hungary in 1875; V. Tschusi-Schmidhofen, Verh. z.-b. Wien, xxvii. p. 195.

Sarcops lowii, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 344, Sulu Archipelago.

Sturnus unicolor and *S. humii* figured; J. Gould, B. Asia, pt. xxix. *S. sericeus* figured; David & Oustalet, Ois. Chine, Atlas, pl. lxxxvii.

ARTAMIDÆ.

Artamus brevipes, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 70, "Island of the Pacific Ocean" [*sic*].

Artamus insignis, sp. n., P. L. Sclater, P. Z. S. 1877, p. 101, pl. xv., New Ireland.

ICTERIDÆ.

Molothrus aeneus: notes on; J. C. Merrill, Bull. Nutt. Orn. Club, ii. p. 85.

PARADISEIDÆ.

See SHARPE, *suprà*, p. 23.

Ælurædus stonii, sp. n., R. B. Sharpe, Nature, xiv. p. 339, Laroki, S. E. New Guinea [omitted from Zool. Rec. 1876].

Amblyornis inornata. Description of breeding habits, and figure of nest; O. Beccari, Ann. Mus. Genov. ix. p. 382, pl. viii.

Manucodia comrii and *M. chalybea* figured; J. Gould, B. New Guinea, pt. v.

Paradisea sanguinea and *P. raggiana* figured; *id. op. cit.* pt. iv.

Phonygama jamesi, sp. n., (*Manucodia keraudreni*, Salv., nec Less.), R. B. Sharpe, Cat. B. Brit. Mus. iii. p. 181, South-eastern New Guinea.

CORVIDÆ.

Heterocorax, g. n., type *Corvus capensis*; R. B. Sharpe, Cat. B. Brit. Mus. iii. pp. 5 & 11.

Rhinocorax, g. n., type *Corvus affinis*; *id. l. c.* pp. 5 & 45.

Microcorax, g. n., contains *Corvus jamaicensis*, and allied West Indian species; *id. l. c.* pp. 6 & 48.

Macrocorax, g. n., type *Corvus fuscicapillus*; *id. l. c.* pp. 7 & 51.

Corvus annectens, *C. fallax*, and *C. modestus*, spp. nn., F. Brüggemann, Abh. Ver. Brem. v. pp. 74-76; their bills figured, pl. iii. figs. 3-5, Celebes.

Corvus, sp. inc., New Britain, ? *C. enca* or *C. orru*; P. L. Sclater, P. Z. S. 1877, p. 104. *C. macrorrhynchus*, Wagl., discussed; A. O. Hume, Str. Feath. 1877, p. 461.

Cyanocitta pulchra, sp. n., G. N. Lawrence, Ann. Lyc. N. York, xi. [1875] p. 163, Ecuador.

Cyanocitta ultramarina, var. *arizonæ* figured, H. W. Henshaw, in Wheeler's Rep. Geogr. Surv. v. pl. xii.

Cyanocorax — ?, G. N. Lawrence, Ann. Lyc. N. York, xi. [1875] p. 164, Pacasmayo, N. Peru.

Cyanopoli *cyaneus* figured ; David & Oustalet, Ois. Chine, Atlas, pl. lxxxiv.

Dendrocitta assimilis, sp. n., A. O. Humo, Str. Feath. 1877, p. 117, Tenasserim. *D. occipitalis* figured ; R. B. Sharpe, Cat. B. Brit. Mus. iii. pl. iii. *D. sinensis* figured ; David & Oustalet, Ois. Chine, Atlas, pl. lxxxv.

Fregilus graculus. Remarks on this species in the Swiss Alps ; A. Girtanner, Zool. Gart. 1877, p. 145.

Garrulus leucotis figured ; R. B. Sharpe, Cat. B. Brit. Mus. iii. pl. iv., Burmah. *G. sinensis* described ; *id. tom. cit.* p. 101, China. *G. brandti* replaces *G. japonicus* in N. Japan ; R. Swinhoe, Ibis, 1877, p. 146.

Perisoreus canadensis, var. *capitalis* figured ; H. W. Henshaw, in Wheeler's Rep. Geogr., Surv. v. pl. xiii. *P. capitalis* and *P. obscurus* figured ; R. B. Sharpe, Cat. B. Brit. Mus. iii. pl. v. figs. 1 & 2.

Podoces panderi, remarks on, and figure ; M. Bogdanow, J. f. O. 1877, p. 81, pl. iii. fig. 2.

Psittorhinus cyanogenys, sp. n., R. B. Sharpe (æ Gray), Cat. B. Brit. Mus. iii. p. 140, pl. ix.

Physocorax moneduloides figured, R. B. Sharpe, Cat. B. Brit. Mus. pl. i. New Caledonia.

Scissirostrum dubium, bills figured ; F. Brüggemann, Abh. Ver. Brem. v. p. 79, pl. iii. figs. 11 & 12.

Strepera crissalis (p. 58, figured, pl. ii.), *S. intermedia* (p. 59), spp. nn., R. B. Sharpe, Cat. B. Brit. Mus. iii.

Urocissa sinensis figured ; David & Oustalet, Ois. Chine, Atlas, pl. lxxxiii.

Xanthura melano-cyanea, *X. turcosa*, and *X. quindiana* figured ; R. B. Sharpe, Cat. B. Brit. Mus. iii. pls. vi., vii., & viii.

COLUMBÆ.

COLUMBIDÆ.

Carpophaga pæcilorrhœa, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 84, Celebes. *C. vanoyeki* obtained in Duke of York Island ; P. L. Selator, P. Z. S. 1877, p. 109. *C. rhodinolema*, sp. n., *id. tom. cit.* p. 555, Admiralty Islands.

Chalcophaps wallacii, sp. n., F. Brüggemann, l. c. p. 464, Celebes. *C. indica* figured ; G. D. Rowley, Orn. Misc. ii. pl. li.

Chamæpelvia buckleyi, sp. n., P. L. Selator & O. Salvin, P. Z. S. 1877, p. 21, Ecuador.

Geotrygon costaricensis figured ; G. D. Rowley, Orn. Misc. iii. (pt. xi.) pl. lxxxvii.

Goura albertisi, sp. n., T. Salvadori, Atti Acc. Tor. xi. pp. 624-627, 674-682, pl. vii., New Guinea [omitted from Zool. Rec. xiii.]. *G. schuteri*, sp. n., *id.* Ann. Mus. Genov. ix. p. 45, Fly River, New Guinea. *G. beccarii*, sp. n., *id. tom. cit.* p. 208, note, Humboldt's Bay, Papua, from a crest. [*Cf. op. cit.* viii. p. 406.]

Ianthænas rawlinsoni, sp. n., R. B. Sharpe, Nature, xiv. [1876] p. 339, S. E. New Guinea ; = *I. albigularis*, Bp., *id.* J. L. S. xiii. p. 503.

Leptotila albifrons in Southern Texas ; E. Coues, Bull. Nutt. Orn. Club, ii. p. 82.

Macropygia browni, sp. n., P. L. Sclater, P. Z. S. 1877, p. 110, Duke of York Island. *M. keyensis*, sp. n.?, Key Islands, and *M. griseinucha*, sp. n., Jobi, Miosnom, Misori, Mafor, T. Salvadori, Ann. Mus. Genov. ix. p. 204.

Myristicivora. Observations on this genus ; T. Salvadori, Ann. Mus. Genov. ix. pp. 265-276. Tail feathers figured of *M. melanura*, *M. bicolor*, and *M. spilorrhoa* ; id. l. c.

Phabotreron brevirostris, sp. n., differentiated from *P. leucotis* ; Lord Tweeddale, P. Z. S. 1877, p. 549, Pasananca, Philippine Islands. *P. nigrorum*, sp. n., R. B. Sharpe, Tr. L. S. (2) i. p. 346, Negros, Philippines.

Philogenas johannæ, sp. n., P. L. Sclater, P. Z. S. 1877, p. 112, pl. xvi. Duke of York Island ?.

Ptilonopus nuchalis, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 80, Celebes ; *P. fischeri*, sp. n., id. tom. cit. p. 82, pl. iv., Celebes. *P. ponapensis*, sp. n., O. Finsch, P. Z. S. 1877, p. 779, Ponapé, Eastern Carolines.

Ptilopus : remarks on the genus ; G. D. Rowley, Orn. Misc. ii. pp. 337-351. *P. insolitus* and *P. jobiensis* figured, op. cit. pls. lxvi. & lxvii. *P. (Eldir[r])hinus*, subg. n.) *globifer*, sp. n., J. Cabanis & A. Reichenow, SB. nat. Fr. 1876, p. 73, New Hanover ; figured, J. f. O. 1877, pl. iv. *P. sonurus*, sp. n., T. Salvadori, Ann. Mus. Genov. ix. p. 197, Aru Islands. *P. johannis*, sp. n., P. L. Sclater, P. Z. S. p. 556, Admiralty Islands. *P. ? incognitus*, sp. n., ♀, Lord Tweeddale, Ann. N. H. (4) xx. p. 538, N. Mindanao, Philippines ; referred to *Xenotreron*, id. P. Z. S. 1877, p. 832.

Eldirrhinus insolitus obtained on Duke of York's Island ; P. L. Sclater, P. Z. S. 1877, p. 110.

Turtur comorensis, sp. n., E. Newton, P. Z. S. 1877, p. 300, Anjuan Island, Comoro group.

GALLINÆ.

PTEROCLIDÆ.

Syrnhaptes paradoxus : its occurrence in the Modenese in May, 1876 ; A. Carruccio, Ann. Soc. Mod. (2) 1877, p. 131, with photographs. Remarks on ; K. G. Henke, Bull. Mosc. 1877, p. 117.

PHASIANIDÆ.

Cerionis temmincki (pl. cxii.), *C. caboti* (pl. cxi.), figured ; David & Oustalet, Ois. Chine, Atlas.

Crossoptilon mantchuricum (pl. cvi.), *C. tibetanum* (pl. cvii.), *C. auritum* (pl. cviii.), figured ; iid. l. c.

Euplocamus swinhoii figured ; iid. l. c. pl. cii.

Gallus sonnerati figured ; J. Gould, B. Asia, pt. xxx.

Gallus domesticus: notes on its osteology and myology by V. C. Vaughan, Ann-Arbor, Michigan, 1876, 12mo, pp. 116, cuts.

Ithaginis geoffroyi (pl. cxiii.), *I. sinensis* (pl. cxiv.) figured; David & Oustalet, Ois. Chine, Atlas.

Lophophorus lhuysi figured; *iid.* l. c. pl. cx.

Lobiophasis castaneicaudatus, sp. n., R. B. Sharpe, P. Z. S. 1877, p. 94, Borneo; figured, J. Gould, B. Asia, pt. xxx.

Numida ellioti, sp. n., A. D. Bartlett, P. Z. S. 1877, p. 652, pl. lxxv. Mombasas, East Africa.

Phasianus decollatus (pl. c.), *P. ellioti* (pl. ci.) figured; David & Oustalet, Ois. Chine, Atlas.

Polyplectron schleiemacheri, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 461, pl. ix. Borneo. *P. intermedium*, Hume, = *P. germaini*, Elliot; A. O. Hume, Str. Feath. 1877, p. 118.

Phasianus insignis, remarks upon; D. G. Elliot, *tom. cit.* p. 198.

Pucrasia xanthospila (pl. civ.) *P. darwini* (pl. cv.) figured; David & Oustalet, Ois. Chine, Atlas.

Tetraophasis obscurus figured; *iid. op. cit.* pl. cix.

Thaumatococcus amherstii figured; *iid. op. cit.* pl. ciii.

TETRAONIDÆ.

Cupidonia cupido var. *pallidicinctus*, Ridg.: note on; G. N. Lawrence, Bull. Nutt. Orn. Club, ii. p. 52. *C. cupido*: a hybrid between it and *Pediceetes phasianellus*, var. *columbianus*; W. Brewster, *tom. cit.* p. 66.

Cyrtonyx sumichrasti, sp. n., G. N. Lawrence, Ann. N. Y. Ac. Sc. i. p. 51, Mountains of Santa Efigenia, Tehuantepec.

Tetrao mlokosiewiczi, remarks on; A. v. Pelzeln, Mitt. Orn. Ver. Wien, 1877, p. 25.

PERDICIDÆ.

Coturnix communis figured; H. F. Dresser, B. Eur. pts. lxiii. & lxiv.

Francolinus intermedius, sp. n. (?), name suggested for a bird which appears to be distinct from *F. pictus*; E. A. Butler, Str. Feath. 1877, p. 211.

Lerwa nivicola figured; David & Oustalet, Ois. Chine, Atlas, pl. cxv.

Odontophorus cinctus figured; G. D. Rowley, Orn. Misc. iii. pt. xi. pl. lxxxvi.

Perdix cinerea figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Tetraogallus challei, sp. n., E. Oustalet, Bull. Soc. Philom. 1875, p. 54; = *T. caspius* (Gm.), which is the oldest name, and also = *T. tauricus*, Dresser; C. G. Danford, Ibis, 1877, pp. 253 & 254. *T. caspius* obtained in the Cilician Taurus; *id. tom. cit.* p. 267.

Tetraogallus caucasicus, young in down figured; A. Marchand, R. Z. (3) v. p. 354, pl. cxxxiii.

Turnix nigrescens, sp. n., Lord Tweeddale, P. Z. S. 1877, p. 765, Zebu, Philippine Islands.

MEGAPODIIDÆ.

Megapodius rubrifrons, sp. n., P. L. Selater, P. Z. S. 1877, p. 556, Admiralty Islands. *M. pusillus*, sp. n., Lord Tweeddale, *tom. cit.* p. 765, and figured, pl. lxxviii., Zebu, Philippine Islands. *M. stairi*, Gray, appears to be peculiar to the Island of Ninafou, and is not found in Samoa, where no Megapode exists; O. Finsch, P. Z. S. 1877, p. 784.

Talegallus, remarks on the genus; T. Salvadori, Ann. Mus. Genov. ix. p. 327.

CRACIDÆ.

See GADOW, for anatomy, *suprà*, p. 9.

Craz erythronatha, sp. n., P. L. Selater & O. Salvin, P. Z. S. 1877, p. 22, Colombia.

Pauxis galeata, remarks on egg; G. D. Rowley, P. Z. S. 1877, p. 684.

Penelope albipennis, sp. n., L. Taczanowski, *tom. cit.* p. 746, North-western Peru.

GRALLÆ.

RALLIDÆ.

Coturnicops ayresi, sp. n., J. H. Gurney, in Note to T. Ayres on Ornith. of Transvaal, Ibis, 1877, p. 352, pl. vii.

Fulica alba of Lord Howe's Island represented in a volume of original drawings by G. Raper; O. Salvin, P. Z. S. 1877, p. 95.

Gallinula lepida, sp. n., F. Brüggemann, Abh. Ver. Brem. v. p. 91, locality unknown (Rosenberg). *G. sandvicensis*, sp. n., T. H. Streets, Ibis, 1877, p. 25, Hawaiian group.

Ocydromus earli: its alleged crossing with the domestic fowl; W. L. Buller, Tr. N. Z. Inst. ix. p. 341.

Porphyrio alleni obtained near Murcia, S.E. Spain, and *P. variegatus*, Guirao, is identical with it; H. Saunders, Bull. Soc. Z. Fr. ii. p. 188.

Porzana spiloptera, sp. n., H. Durnford, Ibis, 1877, pp. 194 & 195, pl. iii. Buenos Ayres. *P. maruetta* figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Rallus cypereti (Stolz. MS.), sp. n., L. Taczanowski, P. Z. S. 1877, p. 747, Santa Luzia, W. Peru.

Rallina mandarina figured; David & Oustalet, Ois. Chine, Atlas, pl. cxxiii.

Schizoptila, g. n., type *Rallina rosenbergi*, Schl.; F. Brüggemann, Abh. Ver. Brem. v. p. 94 [cf. T. Salvadori, Ibis, 1876, p. 385].

ARAMIDÆ.

Aramides cayennensis in Wiltshire; C. A. Smith, Zool. 1877, p. 18.

SCOLOPACIDÆ.

Actiturus longicaudus figured; H. E. Dresser, B. Eur. pts. lix. & lx.
Eurymorrhynchus pygmaeus. Its osteology and pterylosis discussed and illustrated; John Anderson, Tr. L. S. (2) i. p. 213, pl. xxxv.

Gallinago gallinula figured; H. E. Dresser, B. Eur. pts. lvii. & lviii.
 On a variety intermediate between this and the so-called Sabine's Snipe;
 J. E. Harting, P. Z. S. 1877, p. 533. *G. solitaria* figured; David &
 Oustalet, Ois. Chine, Atlas, pl. cxxii.

Himantopus candidus figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.
Ibidorrhynchus struthersi figured; David & Oustalet, Ois. Chine, Atlas,
 pl. cxviii.

Numenius cyanopus: on a bird, supposed to belong to this species,
 obtained in New Zealand; J. von Haast, Tr. N. Z. Inst. ix. p. 427.

Numenius phaeopus occurs at Hakodadi; R. Swinhoe, Ibis, 1877, p. 146.
Pseudoscolopax semipalmatus figured; David & Oustalet, Ois. Chine,
 Atlas, pl. cxxi.

Scolopax rusticola figured; H. E. Dresser, B. Eur. pts. lxi. & lxii.
Totanus glareolea (pts. lvii. & lviii.), *T. hypoleucus* (pts. lxi. & lxii.),
 figured; *id. op. cit.*

Tringa canutus found breeding in Grinnell Land and Discovery Bay;
 H. W. Feilden, Ibis, 1877, p. 407. *T. canutus* (pts. lvii. & lviii., lix. &
 lx.), *T. striata* [better known as *T. maritima*] (pts. lvii. & lviii.), figured;
 H. E. Dresser, B. Eur. *T. subarquata*, young in down obtained in the
 Ob Region; O. Finsch, Ibis, 1877, p. 60.

GLAREOLIDÆ.

Glareola nuchalis, var. *marchei*, discriminated; E. Oustalet, Bull. Soc.
 Phil. Paris, (7) i. p. 104, Okanda, West Africa.

CHARADRIIDÆ.

Ægialitis veredus figured; David & Oustalet, Ois. Chine, Atlas, pl. cxx.
Calidris arenaria. Eggs obtained in Grinnell Land; H. W. Feilden,
 Ibis, 1877, p. 406. Bird figured; H. E. Dresser, B. Eur. pts. lix. & lx.

Hematopus, sp. n.?, allied to *H. niger*: if distinct, it is proposed to
 call it *H. ophthalmicus*; Castelnau & E. P. Ramsay, P. Linn. Soc. N. S. W.
 i. p. 385, Bountiful Island. *H. ostralegus* figured; H. E. Dresser, B. Eur.
 pts. lxi. & lxii.

Hoplopterus spinosus figured; H. E. Dresser, B. Eur. pts. lxiii. & liv.

GRUIDÆ.

Grus cinerea. Young in down figured; A. Marchand, R. Z. (3) v.
 p. 357, pl. cxxxviii.

CICONIIDÆ.

See REICHENOW, *suprà*, p. 18.

Ciconia dicrura, new name for *C. maguari* (Gm.); A. Reichenow, J. f. O. 1877, p. 169.

PLATALEIDÆ.

Platalea leucorodia. Young in down figured; A. Marchand, R. Z. (3) v. p. 355, pl. cxxxvi. Description of nesting in Holland; P. L. Sclater & W. A. Forbes, Ibis, 1877, p. 412.

Platalea regia in New Zealand; W. L. Buller, Tr. N. Z. Inst. ix. p. 327.

IBIDIDÆ.

See ELLIOTT & REICHENOW, *suprà*, pp. 8 & 18

Grptocephalus, g. n., type *Geronticus davisoni*, Hume; D. G. Elliot, P. Z. S. 1877, p. 491.

Ibis gigantea, Cambodia, and *I. harmandi*, Siam, spp. nn., E. Oustalet, C. R. lxxxiv. p. 276, and Bull. Soc. Phil. (7) i. pp. 25-30 [latter probably = *I. davisoni*].

Ibis nippon (pl. cxvi.) and *I. nippon* var. *sinensis* (pl. cxvii.) figured; David & Oustalet, Ois. Chine, Atlas.

Lampribus, g. n., type *Ibis olivacea*, Du Bus; D. G. Elliot, P. Z. S. 1877, p. 507; pl. li., Guinea, Prince's Island, and Denkora.

Thaumatibis, g. n., type *Ibis gigantea*, Oust.; *id. tom. cit.* p. 489.

SCOPIDÆ.

See REICHENOW, *suprà*, p. 18.

ARDEIDÆ.

See REICHENOW, *suprà*, p. 18.

Ardea cinerea and *A. minuta*. Young in down described; C. Stölker, J. f. O. 1877, p. 202.

Butio, subg. n., A. Reichenow, *tom. cit.* p. 247, type *Ardea melanolophus*. *Botaurus lentiginosus* killed in Islay; J. Lumsden, P. N. H. Soc. Glasg. 1876, p. 43.

Doryphorus, subg. n., A. Reichenow, J. f. O. 1877, p. 259, type *Ardea agami*.

Microcnus, subg. n., *id. tom. cit.* p. 249, type *A. pumila*.

Mesites an aberrant form of this group; E. Bartlett, P. Z. S. 1877, p. 292.

PHŒNICOPTERIDÆ.

See REICHENOW, *suprà*, p. 18.

Phenicopterus antiquorum. Young in down figured; A. Marchand, R. Z. (3) v. p. 358, pl. cxxxix.

Phenicopterus roseus. Its anatomy and systematic position; H. Gadow, J. f. O. 1877, p. 382: intestines figured, *tom. cit.* pl. vi.

ANSERES.

ANATIDÆ.

Anser albifrons figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Anser cineraceus. Young in down figured; A. Marchand, R. Z. (3) v. p. 355, pl. cxxxv.

Bernicla leucopsis and *B. brenta* figured; H. E. Dresser, B. Eur. pts. lxi. & lxii.

Clangula albeola figured; *id. op. cit.* pts. lxiii. & lxiv. *C. histrionica* obtained at Hakodadi; R. Swinhoe, Ibis, 1877, p. 147.

Clangula islandica obtained at Valencia, Spain; H. Saunders, Bull. Soc. Z. Fr. ii. p. 200.

Cosmonetta histrionica figured; H. E. Dresser, B. Eur. pts. lix. & lx.

Cygnus immutabilis: remarks on; T. Southwell, Tr. Norw. Soc. 1876 & 1877, p. 258. Notes on the young bred in confinement; J. H. Gurney, P. Z. S. 1877, p. 579.

Eristomura leucocephala figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Fuligula nationi, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1877, p. 522, Lima, Peru. *F. marila* figured; H. E. Dresser, B. Eur. pts. lxiii. & lxiv.

Fulix baeri figured; David & Oustalet, Ois. Chine, Atlas, pl. cxxiv.

Harelda glacialis obtained at Hakodadi; R. Swinhoe, Ibis, 1877, p. 147.

Oedemia fusca and *O. perspicillata* (pts. lxi. & lxii.), *O. nigra* (pts. lxiii. & lxiv.), figured, H. E. Dresser, B. Eur.

Plectropterus niger, sp. n., P. L. Sclater, P. Z. S. 1877, p. 47, pl. vii., Zanzibar.

Sarcidiornis: remarks on the African form; R. Trimen, P. Z. S. 1877, p. 683.

Somateria labradoria figured, G. D. Rowley, Orn. Misc. ii. pl. lv., and details given of this nearly extinct species, pp. 205-223, with illustrations of the breast-bones, head, and feet of this bird and its allies. *S. spectabilis* figured; H. E. Dresser, B. Eur. pts. lix. & lx.

LARIDÆ.

Anous stolidus and *A. melanogenys* obtained at Inaccessible Island, 37° S. lat.; H. Saunders, P. Z. S. 1877, pp. 797 & 798.

Bruchigavia [*Larus*] *longirostris*, sp. n., G. Masters, P. Linn. Soc. N. S. W. ii. p. 113, King George's Sound.

Hydrochelidon hybrida figured; H. E. Dresser, B. Eur. pts. lix. & lx.

Larus glaucus figured, *id. op. cit.* pts. lix. & lx. *L. hemprichi* and 1877. [VOL. XIV.]

L. leucophthalmus on the south coast of France; J. Vian, Bull. Soc. Z. Fr. ii. p. 32. *L. ridibundus*: young in down figured; A. Marchand, R. Z. (3) v. p. 354, pl. cxxxiv.; remarks on its breeding at Scoulton Mere, G. D. Rowley, Orn. Misc. ii. p. 407: remarks on intelligence and manner of living, H. Neweklowsky, Mitt. Orn. Ver. Wien, 1877, p. 5.

Pagophila eburnea figured; H. E. Dresser, B. Eur. pts. lvii. & lviii.

Rhodostethia rosea figured; *id. ibid.*

Stercorarius pomatorrhinus figured; H. E. Dresser, B. Eur. pts. lvii. & lviii.

Sterna ancesthera obtained on coast of England; H. Saunders, P. Z. S. 1877, p. 43. *S. bergii* breeding at Astola; E. A. Butler, Str. Feath. 1877, p. 298. *S. maxima*, Bodd., obtained in Straits of Gibraltar; H. Saunders, Bull. Soc. Z. Fr. ii. p. 202. *S. portlandica*, remarks on the so-called; W. Brewster, Ann. Lyc. N. York, xi. p. 201. *S. saundersi* and *S. gouldi*, spp. nn., A. O. Hume, Str. Feath. 1877, p. 326, India. *S. cantiaca* and *S. caspia* (pts. lix. & lx.), *S. fuliginosa* (pts. lxi. & lxii.) figured; H. E. Dresser, B. Eur.

PROCELLARIIDÆ.

Æstrelata mollis must be erased from the Birds of Kerguelen Island, the supposed example obtained by the German expedition being *Æ. brevirostris*; O. Salvin, Ibis, 1877, p. 480, note.

Procella antarctica, notes on; J. Hector, Tr. N. Z. Inst. ix. p. 464.

Procellaria albigularis, sp. n., O. Finsch, P. Z. S. 1877, p. 722, Fiji Islands. *P. nativitatis*, sp. n., T. H. Street, Bull. U. S. Nat. Mus. No. 7, p. 29, Christmas Island, Fanning Group. *P. hesitata*, Forst.?, figured; E. v. Martens, Preuss. Exp. Ost.-Asien, Zool. pl. iv.

Puffinus griseus and *P. major* (pts. lxi. & lxii.), *P. anglorum* and *P. kuhli* (pts. lvii. & lviii.), figured; H. E. Dresser, B. Eur.

Thalassidroma oceanica obtained at Malaga; H. Saunders, Bull. Soc. Z. Fr. ii. p. 205.

PELECANIDÆ.

Pelecanus longirostris, sp. n., A. O. Hume, Str. Feath. 1877, p. 491, Dacca.

Pelecanus onocrotalus; on its anatomy; E. Alix, Bull. Soc. Z. Fr. ii. p. 287.

Phalacrocorax finschi, sp. n., R. B. Sharpe, Voy. Erebus and Terror, Birds, App. p. 34, New Zealand. [Omitted from Zool. Rec. xii.]

Sula: remarks on the genus; A. O. Hume, Str. Feath. 1877, p. 304.

PODICIPIDÆ.

Podiceps albens, sp. n., Mandelli, *apud* W. T. Blanford, Str. Feath. 1877, p. 486, Sikkim.

ALCIDÆ.

See BARROWS and BUREAU, *suprà*, pp. 1 & 5.

Alca troile, a variety with yellow bill exhibited; A. Newton, P. Z. S. 1877, p. 2; *A. troile* figured (pts. lxi. & lxii.), *A. bruennichi* (pts. lix. & lx.), *A. torda* (pts. lxiii. & lxiv.); H. E. Dresser, B. Eur.

Fratercula arctica, the various stages of its bill figured; L. Bureau, Bull. Soc. Z. Fr. ii. pl. iv. *F. glacialis*, *F. corniculata*, *F. (Lunda) cirrata*, beaks figured; *id. tom. cit.* pl. v. figs. 1-4.

Fratercula arctica figured; H. E. Dresser, B. Eur. pts. lxi. & lxii.

Mergulus alle figured; *id. tom. cit.* pts. lix. & lx.

Uria grylle figured; *id. op. cit.* pts. lxi. & lxii.

SPHENISCIDÆ.

Endiptyula undina: its specific distinctness from *E. minor* affirmed, and cuts of their bills given; W. L. Buller, Tr. N. Z. Inst. ix. p. 337, pl. xv. figs. 3 & 4.

STRUTHIONES.

STRUTHIONIDÆ.

See MIVART & NEWTON, *suprà*, p. 15.

CASUARIDÆ.

See MIVART & NEWTON, *suprà*, p. 15.

Casuarus picticollis and *C. westermanni* figured; J. Gould, B. New Guinea, pt. v.

APTERYGIDÆ.

See MIVART & NEWTON, *suprà*, p. 15.

DINORNITHIDÆ.

See BOOTH, MIVART, NEWTON, OWEN, RUSSELL.

ODONTORNITHES.

New characters given for the group; disproving any near affinity with the *Colymbidæ*, and establishing an unmistakable connection with the *Ratitæ*, especially in the skull and scapular arch. O. C. Marsh, Am. J. Sci. (3) xiv. pp. 85 & 86.

Baptornis advenus, g. & sp. nn., *id. l. c.* pp. 86 & 87, Cretaceous beds of Western Kansas.

Hesperornis regalis restored and figured; *id. l. c.* pl. v.

REPTILIA.

BY

A. W. E. O'SHAUGHNESSY.

GENERAL ANATOMY.

- BORN, G. Ueber die Nasenhölen und der Thränennasengang der Amphibien. *Morph. J.B.* ii. pp. 577-646, pls. xxxix.-xli.
- . Zum Carpus und Tarsus der Saurier. *L. c.* pp. 1-27, pl. i.
- FUCHS, E. Beitrag zur Kenntniss des Froschlutes und der Froschlymphe. *Arch. Anat. Phys.* lxxi. pp. 78-106, pl. iv.
- KERBERT, C. Ueber die Haut der Reptilien und anderer Wirbelthiere. *Arch. mikr. Anat.* xiii. pp. 205-262, pls. xviii.-xx.
- LANGENDORFF, O. Die Beziehungen des Sehorgans zu den reflexhemmenden Mechanismen des Froschgehirns. *Z. Anat. Entwickel.* 1877, pp. 435-442.
- LEYDIG, F. Ueber die allgemeinen Bedeckungen der Amphibien. *Arch. mikr. Anat.* xii. pp. 119-242.
- MEYER, P. Études histologiques sur le Labyrinthe membraneux et plus spécialement sur le Limaçon chez les Reptiles et les Oiseaux. *Strasburg & Paris* : 1876, 8vo, pp. 189, 5 pls.
- MIVART, ST. G., & CLARKE, R. On the Sacral Plexus and Sacral Vertebrae of Lizards. *J. L. S.* xiii. pp. 370-373. (Abstract.)
- PARKER, W., & BETTANY, G. Morphology of the Skull. *London* : 8vo. On Skulls of the Reptilia ; chaps. iv. v. vi. pp. 91-218.
- SPENGEL, J. Die Segmentalorgane der Amphibien. Vorläufige Mittheilung. *Verh. Ges. Würzb. (n.s.)* x. pp. 89-92.
- . Ueber das Urogenitalsystem der Amphibien. *Cecilie*, pp. 2-39 ; *Urodela*, pp. 39-77 ; *Anura*, pp. 77-108. *Arb. Inst. Würzb.* iii. 114 pp. 3 pls.
- STECKER, A. Zur Kenntniss des Carpus und Tarsus bei Chamæleon. *SB. Ak. Wien*, lxxv. pp. 7-16, pls. i. & ii.

- WEBER, M. Ueber die Nebenorgane des Auges der Reptilien. 1^{er} Artikel: Die Nebenorgane des Auges der einheimischen Lacertidæ. Arch. f. Nat. (2) 1877, pp. 261-342, pls. xvii.-xix.
- WIEDERSHEIM, R. Das Kopfskelet der Urodelen, ein Beitrag zur vergleichenden Anatomie des Wirbelthier-Schädels. Morph. JB. iii. pp. 352-448 & 459-548, pls. xix.-xxviii.; and separately, Leipzig: 1877, 8vo, 187 pp. 9 pls.
- . Die ältesten Formen des Carpus und Tarsus der heutigen Amphibien. Morph. JB. ii. pp. 421-434, pl. xxix. Nachträgliche Bemerkungen. *Op. cit.* iii. pp. 152-154, 5 pls.
- . Die Kopf-drüsen der geschwänzten Amphibien. Z. wiss. Zool. xxvii. p. 1, 4 pls.
- . Ueber Neubildung von Kiemen bei Siren lacertina. Morph. JB. iii. pp. 630 & 631.

COLLIN DE PLANCY, V. Recherches sur l'alimentation des Reptiles et des Batraciens de France. Paris: 1876, 8vo.

- . L'accouplement et la Ponte chez les lézards de France. Bull. Soc. Zool. Fr. ii. pp. 325-358.

Observed in *Lacerta ocellata*, *viridis*, *stirpium*, *muralis*, *vivipara*, *Anguis fragilis*, and *Seps chalcides*.

FAUNÆ.

Europe.

- KNAUER, F. Europa's Kriechthiere und Lurche. Wien: 1877, 8vo.*
- LATASTE, F. Aperçu de la Faune Herpétologique du Plateau Central de la France. Bull. Soc. Zool. Fr. i. [1876] pp. 204-212.
- LEYDIG, F. Die Anuren Batrachier der Deutschen Fauna. Bonn: 1877, 8vo, 164 pp. 9 pls.
- Detailed descriptions of the tail-less *Batrachia* of Germany.
- BOSCA, E. Catologo de los Reptiles y Anfios observados en España, Portugal, é Islas Baleares. An. Soc. Esp. vi. pp. 39-68.
- SEVANE, V. Reptiles y Anfios de Galicia. *Tom. cit.* pp. 349-358.
- TACZANOWSKI, L. Liste des Vertébrés de Pologne. Bull. Soc. Zool. Fr. ii. (Reptiles) pp. 167 & 168.

Asia.

Reptiles of the shores and islands of the Aral Sea. A. ALÉNITZEN, St. Petersburg [1876], 64 pp.

W. PETERS gives a short notice of the *Reptilia* collected by G. Finsch in Siberia. MB. Ak. Berl. 1877, p. 736.

* F. Knauer has also published, "Beobachtungen an Reptilien und Amphibien in der Gefangenschaft," 8vo, 54 pp.; and "Fang der Amphibien und Reptilien und deren Conservirung für Schulzwecke." Wien: 1875, 8vo, 20 pages.

Africa.

W. PETERS enumerates the *Reptilia* collected in Chinchoxo (W. Africa), and presented by the German African Society to the Berlin Museum, describing a considerable number of new species, and adding notes on many of the others. *L. c.* pp. 611-620, pl.

Madagascar and the Mascarenes.

BÜTTGER, O. Die Reptilien und Amphibien von Madagascar. *Abh. Senck. Ges.* xi. pp. 1-56, pl. i.; also separately, Frankfurt-a-M.: 1877, 4to, 51 pp. 1 pl.

Descriptions of all the Reptiles hitherto enumerated as inhabiting Madagascar, founded upon a large collection obtained for the Senckenberg Museum, which, however, only affords one new species (of *Typhlops*), and a few new varieties which will be indicated. Special portions of the paper are devoted to the geographical distribution of reptiles in the island generally, and of the different groups. On page 38, the writer says that *Chamaeleon brookesianus* does not occur there; the Recorder is able, however, to state that there are many specimens from that island in the British Museum collection.

GÜNTHER, A. Some new species of Reptiles from Madagascar. *Ann. N. H.* (4) xix. pp. 313-317.

——. Notice of two large extinct Lizards, formerly inhabiting the Mascarene Islands. *J. L. S.* xiii. pp. 322-327, figs. 1-6.

1. *Didosaurus mauritanus*, g. & sp. nn. Remains found in a locality famous for Dodo bones indicate the existence in Mauritius of a large lizard, 14 or 15 inches long, probably belonging to the *Zonuridae* or *Scincidae*. 2. *Gecko newtoni*, sp. n., from Rodriguez.

W. PETERS notices the *Reptilia* collected by K. Möbius in the Mascarenes and Seychelles. *Tom. cit.* pp. 455-457.

India.

Col. BEDDOME describes three new reptiles from the Madras Presidency, *P. Z. S.* 1877, p. 685; and three new species (*Uropeltidae*) from Southern India, *l. c.*, pp. 167 & 168.

China.

SAUVAGE, H. E. Sur quelques Batraciens de Chine. *Bull. Soc. Philom.* (7) i. pp. 115-118.

O. F. VON MÜLLENDORFF gives a list of Reptiles from Chihli, with their Chinese names. *J. N. China Soc.* (n. s.) xi. pp. 103-105.

A list of the Reptiles collected and observed during the Prussian Expedition in Eastern Asia is given by VON MARTENS (pp. 373-384) in the volume (Berlin: 1876, 8vo) lately issued, which continues the publication from p. 192, where this section of the work was left in 1865. Notices of various reptiles are scattered through the volume; but all the new species were described several years ago, chiefly by Peters, in 1864.

Australasia.

GÜNTHER, A. On a Collection of Reptiles [and Fishes] from Duke of York Island, New Ireland, and New Britain. P. Z. S. 1877, pp. 127-132, pls. xx. & xxi.

The Reptilian fauna of these islands belongs to the Austro-Malayan sub-region.

The same author, in describing 3 new lizards from the Torres Straits, establishes the curious fact of the existence of a *Thecadactylus* in Australia. Ann. N. H. (4) xix, pp. 413-415.

MACLEAY, W. The Lizards of the Chevert Expedition. J. Linn. Soc. N. S. W. ii. pp. 60-69, 97-104.

—. The Ophidians of the Chevert Expedition. L. c. pp. 33-41.

The Ophidian fauna of the south coast of New Guinea is characterized by the prevalence of the non-venomous Colubrine forms of India and Malacca, and the absence of the venomous Australian forms.

—. The Batrachians. L. c. pp. 135-138.

America.

COPE, E. Tenth Contribution to the Herpetology of Tropical America. P. Am. Phil. Soc. xvii. pp. 85-97.

—. Synopsis of the Cold-blooded Vertebrata procured by Prof. James Orton during his exploration of Peru in 1876-77. L. c. pp. 33-48.

W. PETERS has re-investigated the identification and synonymy of Spix's Brazilian Lizards; MB. Ak. Berl. 1877, pp. 407-414. He notices also the Reptilia collected by C. Sachs in Venezuela; a snake, a *Cæcilia*, and a *Pleurodema* are new: L. c. pp. 457-460, pl.

P. BROCCHI describes new species and genera of American *Batrachia*. Bull. Soc. Philom. (7) i. pp. 92, 122-132, 175.

A short notice of the Reptilian fauna of Venezuela by A. ERNST in 'Estudios sobre la Flora y Fauna de Venezuela,' (Caracas: 1877, 4to), p. 279.

H. WEYENBERGH gives a short notice of the Reptiles found in the Argentine States, in R. Napp's "Die Argentinische Republik" (Buenos Ayres; 1876, 8vo), pp. 163-166.

Bermudas.

G. BROWNE GOOD enumerates the reptiles, 4 Turtles and 1 Lizard, *Eumeces longirostris*, Cope. Am. J. Sci. (3) xlv. p. 290.

Galapagos Islands.

A. GÜNTHER notices the Reptiles collected by Commander Cookson, of H.M.S. 'Petrel.' P. Z. S. 1877, p. 66. [See infra, *Chelonia*.]

CHELONIA.

BOUCHARD, J. A note on the instinctive precautions taken by Tortoises on the approach of cold, and their use as a guide to farmers. O. R. lxxxiv. p. 797.

CHAPMAN, H. C. A note on reflex action in Turtles; P. Ac. Philad. 1877, p. 146.

GÜNTHER, A. The Gigantic Land Tortoises (living and extinct) in the Collection of the British Museum. London: 1877, 4to, 96 pp. 54 pls.

Instead of continuing the series of memoirs begun in 1874, in vol. clxv. of the Phil. Trans., Dr. Günther has completed and embodied the whole of his researches on this subject in a volume issued by the Trustees of the British Museum. Through the acquisition of most extensive and valuable new materials, he has been enabled to correct and supplement some of the views expressed in his former treatise; and great additional importance is given to the present work by his interesting discovery of characters distinguishing the Tortoises of the Mascarenes from those of the Galapagos Islands, a solution being thus obtained to what had hitherto appeared, and might always have remained, an insoluble problem. It is now found that:—1. The specimens with a nuchal plate (and with double gular) come from Aldabra. 2. Those with single gular (and without nuchal) come from the Mascarenes. 3. Those without nuchal and with double gular are Galapagos Tortoises.

A complete history of the different races is given, and detailed descriptions of all the species, with figures of entire animals, carapaces, and bones. The species are as follows:—

Races of the Aldabra Group.—*Testudo elephantina*, *daudini*, *ponderosa*, *hololissa*.

The Extinct Races of the Mascarenes.—A, of Mauritius: *T. triserrata*, *inepta*, *leptocnemis*. B, of Rodriguez: *T. vosmari*.

The Races of the Galapagos.—*T. elephantopus* (James Island ?), *nigrita* (locality uncertain), *vicina* (South of Albemarle Island), *microphytes* (North of Albemarle Island), *ephippium* (Charles Island), *abingdoni* (Abingdon Island).

A complete list is given of the large series of specimens now in the British Museum.

LATASTE, F. An inquiry as to the method by which Tortoises absorb the fluid necessary for their economy. Bull. Soc. Zool. Fr. ii. pp. 273-280.

VAILLANT, L. Note sur la disposition des vertèbres cervicales chez quelques Chéloniens. Bull. Soc. Philom. (7) i. pp. 13-15.

—. Note sur la composition anatomique des bâtons du plastron formant la carapace chez les Cistudes et les Cinosternes. L. c. pp. 36-39.

—. Note sur la disposition des pièces osseuses dans le plastron des Sternothères. L. c. pp. 50 & 51.

—. Sur la classification et les affinités réciproques des Chéloniens. L. c. pp. 54-58.

The 'Chersites' and 'Elodites' are united into one family, *Testudinida*, consisting of two tribes *Chersemydina* (Chersites and Elodites Cryptodères, D. & B.) and *Chelydina* (Pleurodères, D. & B.). Fam. ii. *Triony-*

chida = Potamites, D. & B. Fam. iii. *Chelonida* = Thalassites, D. & B., with 2 tribes, *Chelonina* and *Sphargidina*.

CROCÓDILIA.

ALIX, —. Sur la conformation de l'isthme du gosier chez les Crocodiles. Bull. Soc. Philom. (7) i. pp. 168 & 169, & Bull. Soc. Zool. Fr. ii. pp. 247 & 248.

Crocodylus vulgaris, Cuv., var. n. *madagascariensis*, Böttger, Abh. senck. Ges. xi. p. 27, pl. i. fig. 6.

RHYNCHOCEPHALIA.

(*Hatteria*) *Sphenodon guntheri*, sp. n., from Brothers Islands, near Cook Strait, New Zealand; and notes on *S. punctatum*; W. Buller, Tr. N. Z. Inst. ix. pp. 317-325.

SAURIA.

Lanthanotus, g. n., type of a new family, next to *Helodermida*, and distinguished by absence of external ear and an arrangement of the dorsal shields resembling *Crocodylus acutus*; for *L. borneensis*, sp. n. Steindachner, Wien, 1877, 4to, pp. 3 & 4, pl. ii. [anticipatory separate copy of paper in Denk. Ak. Wien, xxxviii. 1878, pp. 95 & 96] Borneo.

VARANIDÆ.

Teiovaranus, g. n., forms a subfamily of *Varanida*, contiguous to the *Teiida*, characterized by the elongate heart-shaped tongue without basal sheath, large mental and rostral shield, and pterygoid teeth; for *T. branickii*, sp. n. Steindachner, l. c. pp. 1-3, pl. i. S. America* [separate copy, as above, pp. 93-95].

TEIIDÆ.

On the synonymy of Spix's species; Peters, MB. Ak. Berl. 1877, p. 411.

Cnemidophorus microlepidopus, *unicolor*, *immutabilis*, p. 93, Tehuantepec; *lineatissimus*, Colima, *lativittis*, Tehuantepec, p. 94; *communis*, *angusticeps*, Central America, p. 95; *costatus*, p. 95, Mexico; Cope, P. Am. Phil. Soc. xvii.: spp. nn.

LACERTIDÆ.

Lacerta. J. v. Bedriaga, in "Beiträge zur Kenntniss der Mauereidechsen," Arch. f. Nat. (2) 1877, pp. 113-120, describes *L. viridi-ocellata*, sp. n., Messina.

* Dr. Steindachner has since informed me that this is no other than *Calloptistes flavipunctata*, D. & B.—RECORDER.

The same writer, on the colours of Lizards; Bull. Mosc. 1877, pp. 46-64.

Lacerta lilfordi and *muralis*; Max Braun, Würzburg, 1876, 8vo.

On *Lacerta muralis caerulea*, Eimer, from Capri; Hartmann, SB. Nat. Fr. 1877, p. 207.

ZONURIDÆ.

On the subdivisions of the *Gerrhonotidæ*. *Megaspis*, g. n., for *M. moreletii* and *fulvus*, Boc. Cope, P. Am. Phil. Soc. xvii. p. 96.

Pterogasterus modestus, sp. n., *id. l. c.* p. 97, Guatemala?

Gerrhonotus monticolus, sp. n., *id. ibid.*, Costa Rica.

SCINCIDÆ.

Hinulia megaspila, Günther, P. Z. S. 1877, p. 128, pl. xxviii., Duke of York Island, and *H. papuensis* and *atro-costata*, Katow, p. 62, *pardalis*, Barrow Island, *spaldingi*, Endeavour River, p. 63, Macleay, J. Linn. Soc. N. S. W. ii. : spp. nn.

Mocoa nigricaudis, sp. n., Macleay, *l. c.* p. 63, Darnley Island.

Carlia macfarlanei, sp. n., Günther, Ann. N. H. (4) xix. p. 413, Torres Straits.

Lygosoma fragile and *ornatum*, spp. nn., Macleay, *l. c.* p. 64, New Guinea.

Eumeces brunneus, *id. l. c.* p. 65, Darnley Island; *E. bocourti*, Brocchi, Bull. Soc. Philom. 1876, p. 95, New Caledonia: spp. nn.

Mabouia marmorata and *uniformis*, Torres Straits, p. 65, *irrorata*, Hall Sound, p. 66, Macleay, *l. c.*, spp. nn.

Heteropus longipes, Endeavour River, *variegatus*, Darnley Island, p. 66, *quinquecarinatus*, Darnley Island, *sexdentatus*, Cape Grenville, *cheverti*, Barrow Island, p. 67, *bicarinatus*, Hall Sound, p. 68; *id. l. c.* spp. nn.

Euprepes longicaudis, Darnley Island, p. 68, *submetallicus*, Hall Sound, *simillimus*, Katow, p. 69, *id. l. c.*; *E. resplendens*, Peters, *l. c.* p. 416, Avalau: spp. nn.

SEPIDÆ.

Gongylus melanurus and *melanopleura*, Günther, Ann. N. H. (4) xix. p. 314, Madagascar, spp. nn.

Herpetosaura occidentalis, sp. n., Peters, *l. c.* p. 416, Cameroons.

ACONTIADÆ.

Acontias holomelas, sp. n., Günther, Ann. N. H. (4) xix. p. 313, Madagascar.

GECKOTIDÆ.

On Spix's Brazilian species; Peters, *l. c.* p. 411.

Thecadactylus australis, sp. n., Günther, Ann. N. H. (4) xix. p. 414, Torres Straits. The only other species is peculiar to tropical America.

Diplodactylus annulatus, sp. n., Macleay, l. c. p. 97, Palm Islands.

Phyllodactylus nigro-fasciatus, Cope, P. Am. Phil. Soc. xvii. p. 36, Peru; *P. doriae* (differentiated from *P. europæus*), Lataste, Bull. Soc. Zool. Fr. ii. pp. 467-469, Tinetto: spp. nn.

Peripia papuensis, *ornata*, *longicaudis*, *dubia*, *marmorata*, *brevicaudis*, Macleay, l. c. pp. 97-99, New Guinea and N. Australia; *P. torresiana*, Günther, Ann. N. H. (4) xix. p. 415, Torres Straits: spp. nn.

Nautilinus pulcherrimus, sp. n., Buller, Tr. N. Z. Inst. ix. p. 326, pl. xvii. New Zealand.

Heteronota fasciata, Hall Sound, *marmorata*, Endeavour River, p. 100, *eboracensis*, Cape York, p. 101, Macleay, l. c. spp. nn.

Gymnodactylus jeyporensis, sp. n., Beddome, P. Z. S. 1877, p. 685, Jeypore Hills.

Phyllopezus, g. n. [near *Gehyra*]. A single row of transverse lamellæ under the base of fingers and toes, the last two joints tapering, clawed. *P. goyazensis*, sp. n., Peters, l. c. p. 415, pl. i. fig. 1, Brazil.

IGUANIDÆ.

W. Peters has revised the synonymy of Spix's Brazilian species, having been able by reference to the types to clear many doubtful points. MB. Ak. Berl. 1877, pp. 407-414.

Leamantus. Monographed: figures of *L. serratus*, Cope, pl. vii. fig. 3, *longipes*, fig. 2; *L. borrei*, sp. n., p. 465, pl. vii. fig. 1, Mexico. Lataste, Bull. Soc. Zool. Fr. ii. pp. 460-466.

AGAMIDÆ.

Tiaris papuensis, p. 101, New Guinea, *longi*, p. 103, Australia, Macleay, l. c.: spp. nn.

Lophognathus lateralis, sp. n., *id.* l. c. p. 103, New Guinea.

Grammatophora jugularis, sp. n., *id.* l. c. p. 104, Cape Grenville.

Agama colonorum, D., var. n. *congica*; *A. picticauda* and *infra-lineata*, spp. nn., W. Africa. Peters, l. c. pp. 612 & 613.

CHAMÆLEONTIDÆ.

Chamæleon gallus, sp. n., Günther, Ann. N. H. (4) xix. p. 319, pl. xvi. B, Madagascar.

Chamæleon pardalis, Cuv., figured and redescribed by Böttger, l. c. p. 25, pl. i. fig. 5. The species hitherto found in Madagascar are enumerated with the exclusion of *C. brookesi*, Gray, stated not to occur in the island [the Recorder may remark that the British Museum possesses a number of specimens which came from thence].

OPHIDIA.

The *Ophidia* of Madagascar, monographed by Böttger, l. c. pp. 3-23, are 26 in number, including only one new species and 3 new varieties,

viz. :—*Herpetodryas bernieri*, D. & B., var. *trilineata*, p. 9, *Dipsas* (*Heterurus*) *gaimardi*, Schl., var. *granuliceps*, p. 14, pl. i. figs. 3 A-C; and *Eleiroidipsas colubrina*, Schl., var. *citrina*, p. 16.

Typhlops madagascariensis, id. l. c. p. 3, pl. i. fig. 1, *acuticaudus*, p. 416, figs. 2-2C, Palaos, (*Onychocephalus*) *angusticeps*, p. 417, figs. 3-3C, New Caledonia; Peters, MB. Ak. Berl. : spp. nn.

Platyplectrurus madurensis, sp. n., Beddome, P. Z. S. 1877, p. 167, Madura.

Silybura dindigalensis and *macror*[*r*] *hyncha*, id. *ibid.*, Southern India, spp. nn.

Labionaris, g. n. (*Calamariidæ*). Internasals 2, præfrontals 2, frenal in direct contact with eye; no præocular, suboculars 2, temporals 4 (2 on each side), supralabials 6, fourth and fifth touching orbit, supranasal 1; nostril hollowed at the expense of the first supralabial; 17 transverse series of scales; subcaudals divided, anal divided. *L. filholi*, sp. n., Brocchi, Bull. Soc. Philom. 1876, p. 94, Fiji Islands.

Ophielaps, g. n. General aspect of the *Elapoides*. Body narrow, cylindrical, scales keeled, tail long, pointed, tapering; urostegals simple, gastrostegals very broad, head elongate, somewhat broader than the neck; temporals numerous. *O. braconnieri*, sp. n., Sauvage, Bull. Soc. Philom. (7) i. p. 109, China.

Elapomorphus coronatus, sp. n., id. l. c. p. 110, South America.

Mainophis, g. n. (*Calamariidæ*); resembles *Brachyorrhus*, Kuhl, from which it is separated by having the anal plate bifid. *M. robusta*, sp. n., Macleay, P. Linn. Soc. N. S. W. ii. p. 36, Katow.

Katophis, g. n. Body and tail rather elongate; head rather narrow, with slightly constricted neck; two pairs of frontals, a loreal and one anterior and three posterior orbitals; eight upper labials; scales elongate, keeled, the outer scale on each side square and not keeled on the anterior half of the body; anal plate bifid; subcaudals in two rows; eye large, pupil rounded; teeth equal, smooth. *K. plumbea*, sp. n., id. *ibid.*, Katow.

Oligodon travancoricum, sp. n., Beddome, l. c. p. 685, South Travancore.

Simotes vaillanti, sp. n., Sauvage ('L'Institut,' Aug. 30, 1876), Bull. Soc. Philom. (7) i. p. 107, China.

Ablabes homeyeri, sp. n., Peters, l. c. p. 620, Pungo Adongo.

Lygophis paccilostomus, Cope, = *Dryophylax elegans*, Tsch., and the genus *Lygophis*, Cope, is renamed *Aporophis*; Cope, P. Am. Phil. Soc. xvii. p. 34.

Lielaphis modestus noticed with revised synonymy; Günther, P. Z. S. 1877, p. 130.

Tropidonotus hypomelas, sp. n., id. *ibid.* fig. 1, Austro-Malayan sub-region.

Tropidonotus natricæ. Note on the period of hatching of its eggs; Lataste, Bull. Soc. Zool. Fr. ii. pp. 401 & 402. Robbing a bird's nest at Gran on the Danube; E. Merkl, Term. füzetek, 1877, p. 82. On its skull; Parker & Bettany, Morphology of Skull, pp. 187-212.

Neusterophis atratus, sp. n., Peters, l. c. p. 614, pl. fig. 1, Chinchoxo.

Helicops trivittatus, sp. n., Cope, l. c. p. 92, hab. ?

Fordonia papuensis, sp. n., Macleay, l. c. p. 35, Katow, New Guinea.

Dromicus (Alsophis) maculivittis, sp. n., Peters, l. c. p. 458, Calabozo.

Dryophylax vitellinus, sp. n., Cope, l. c. p. 33, Peru.

Dendrophis breviceps and *katowensis*, Katow, *darnleyensis*, Darnley Island, Macleay, l. c. pp. 37 & 38; *D. macrops*, Günther, l. c. p. 131, fig. 2, Austro-Malayan sub-region: spp. nn.

Oxyrrhopus rusticus, sp. n., Cope, l. c. p. 92, hab. ?

Lycodon darnleyensis, sp. n., Macleay, l. c. p. 38, Darnley Island.

Pappophis, g.n. Body elongate, moderately stout and slightly trigonal; tail long and tapering; head broad, flat towards the muzzle, which is broad and rounded, and constricted behind into a narrow neck; loreal not longer than high, except at the lower posterior angle, where it is continued into a point; nostril large, between two nasals; rostral pointed above; frontals 4, pentagonal, the posterior pair largest; one large anterior, and 2 small posterior oculars; upper labials 9, lower 12; eyes large, in contact with the 4th, 5th, and 6th upper labials; anterior teeth in both jaws long, acute, and pointed backwards; scales narrow and pointed, the vertebral series larger and rounded; anal entire, subcaudals in two rows. *P. laticeps*, Hall Sound, *flavigastra*, Katow, spp. nn.; *id.* l. c. pp. 39-40.

Erebophis, g.n. (*Erycinides*). Body stout and thick, covered with short scales, which are arranged in numerous rows, and provided with very strong keels. Head like that of a Crotaline snake, above and on the side with numerous scales, rostral flat, truncated, oblique, not extending to the upper surface of the snout; nostril very small, in middle of an oblong shield; eyes small, surrounded by small scales; ventrals rather narrow; tail very short, slightly prehensile, with a single series of subcaudals; teeth in both jaws numerous, the anterior of the maxillary, mandible, and palatine bones much enlarged; tongue very slender; no rudiments of hind limbs. *E. asper*, sp. n., Günther, l. c. p. 132, pl. xxi, Austro-Malayan sub-region.

Boa ortonii, sp. n., Cope, l. c. p. 35, Peru.

Python curtus, Schleg. Description and figure; A. Hubrecht, Ann. Mus. Leyd. No. 1.

Elaps atro-frontalis (Jan, MS.), sp. n., Sauvage, Bull. Soc. Philom. (7) i. p. 111, Cochin China.

Diemenia papuensis, sp. n., Macleay, l. c. p. 40, New Guinea.

Brachysoma triste, Gthr. Supplemental description of a specimen from Cape York; E. Ramsay, P. Linn. Soc. N. S. W. ii. p. 113.

Platyurus laticaudatus, L., on its varieties; Peters, l. c. p. 417.

Apyurus fuliginosus, B. & D., redescribed by Sauvage, Bull. Soc. Philom. (7) i. p. 112.

Acanthophis antarctica, E. Ramsay, l. c. p. 72, Cape York; *A. laevis*, Macleay, l. c. p. 40, Katow: spp. nn.

Atractaspis: notes on the characters of the species. *A. congica*, fig. 2, Chinchoxo, *hildebrandti*, fig. 3, Zanzibar, *natalensis*, fig. 4, Peters, l. c. pp. 616 & 617: spp. nn.

H. Nicholson contradicts F. Buckland's statement that Rattlesnakes cannot produce the sound in wet weather; Nature, xvi. p. 266.

PSEUDOPHIDIA.

Cecilia dorsalis, Peters, *l. c.*, p. 459, pl. figs. 1-3, Angostura; *C. isthmica*, Cope, P. Am. Phil. Soc. xvii. p. 91, Eastern Darien: spp. nn.

Siphonops proximus, p. 90, *sinus*, p. 91, Costa Rica, *oligozonus*, p. 91, habitat?, Cope, *l. c.*: spp. nn.

BATRACHIA.

LEYDIG, F. Beobachtungen über den Bau der Zehen bei Batrachiern und die Bedeutung des Fersenhöckers. SB. Niederrhein. Ges. 1876, p. 83, and Morph. JB. ii. pp. 165-197, 4 pls.

—. Ueber die Schwanzflosse, Tastkörperchen und Endorgane der Nerven bei Batrachiern. Arch. mikr. Anat. xii. p. 513, pl. xxi.

—. Die Anuren Batrachier der Deutschen Fauna. *Vide ante*, p. 2.

BRANDT, A. Fragmentarische Bemerkungen über das Ovarium des Frosches. Z. wiss. Zool. xxviii. pp. 575-586, pl. xxvii. figs. A-D.

—. Bemerkungen über die Eifurchung und die Betheiligung des Keimbläschens an derselben. *L. c.* pp. 587-605, pl. xxvii. figs. 1-28.

PARKER, W., & BETTANY, G. On the Skulls of the Batrachia; *op. cit.* pp. 91-186. Skull of the Axolotl; pp. 91-128. Appendix on Skulls of Urodeles; pp. 129-135. Skull of the Anura; pp. 136-186.

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On causes of destruction of Batrachians; De Confervon, Bull. Soc. Accl. (3) iv. pp. 527 & 528.

On *Pipa americana*, and the development of Batrachians without metamorphosis; Wilder, Am. Nat. xi. p. 491. See also Nature, xv. p. 491, & xvi. p. 420. It would appear that the earlier embryos have branchiæ, which are quickly absorbed. Some remarks with reference to the common Toad and Eft, by G. Henslow, *l. c.* p. 548.

Some observations on the respiration of Frogs; A. Horner, *op. cit.* xvi. p. 30.

On *Diptera* parasitic on *Batrachia*; Collin de Plancy, Bull. Soc. Zool. Fr. ii. pp. 249-257, and E. Taton, *l. c.* pp. 259-265.

BATRACHIA SALIENTIA.

LATASTE, P. Quelques mots à-propos de l'accouplement des Batraciens Anoures. Bull. Soc. Zool. Fr. ii. pp. 266-272.

—. Quelques observations sur les têtards des Batraciens Anoures. *L. c.* pp. 281-286.

Batrachichthys, g. n., Pizarro, Arch. Mus. R. Jan. i. [1876], p. 31, pl. vi., Paraguay. This probably = the young of *Pseudis*, of which a notice and figures are given; S. Garman, Am. Nat. xi. pp. 587-591, fig. 97.

Microdiscopus sumatranus, g. & sp. nn., Peters, MB. Ak. Berl. 1877, p. 422, pl. fig. 4. Subsequently found to correspond closely with *Oxyglossus* (*Phrynoglossus*) *lævis*, Gthr.; *id. l. c.* p. 682.

Rana esculenta. On its naturalization in Norfolk; L. A. Newton, Tr. Norw. Soc. ii. pp. 254-257.

Rana inguinalis, sp. n., Günther, Ann. N. H. (4) xix. p. 316, Madagascar.

Rana vaillanti, p. 175, Belize, *macroglossa*, p. 177, Guatemala, *maculata*, p. 178, Mexico, spp. nn.; *R. lecontei*, Bd. & Gir., redescribed, p. 179: P. Brocchi, Bull. Soc. Philom. (7) i.

Cyclorhamphus angustipes, p. 38, *pustulosus*, p. 39, Cope, *l. c.*, spp. nn., Peru.

Hemiphractus [*Rana scutata*, Spix], its osteology; P. Brocchi, Ann. Sc. Nat. (6) v. No. 7, 18 pp. 1 pl.

Cystignathus labialis, sp. n., Cope, *l. c.*, p. 90, Mexico P. *C. caliginosus*, Gir., redescribed, p. 180, *C. echinatus*, p. 181, Guatemala, *fragilis*, p. 182, Tehuantepec, spp. nn. *Id.*, Bull. Soc. Philom. (7) i.

Pleurodema cinereum, sp. n., Cope, *l. c.* p. 40, Peru.

Pleurodema sachsii, sp. n., or ? *P. bibroni*, var. *B.*, Gthr. (Cat., p. 32), Peters, *l. c.* p. 460, Venezuela.

Liohyperus mexicanus, sp. n., Brocchi, *l. c.* p. 184, Mexico.

Ranaster, g. n. (*Discoglosside*); teeth maxillary and vomerine large, bicuspid, and distant. *R. convexiusculus*, sp. n., Macleay, P. Linn. Soc. N. S. W. ii. p. 135, New Guinea.

Engystoma. Brocchi doubts the distinctness of *Hypopachus*, Kef., and describes specimens identified as *H. inguinalis*, Cope. *E. variolosum*, Cope, and *E. ustum*, Cope; *l. c.* pp. 189-193.

Bufo vulgaris and *Rana temporaria*. Observations on the habits of these species during the spawning season; F. Knauer, Verh. z.-b. Wien, xxvi. (Sitzungsberichte) pp. 73-75.

On toads eating bees; Brunet, Nature, xv. p. 502.

Bufo travancoricus, sp. n., Beddome, P. Z. S. 1877, p. 685, Travancore.

Bufo bocourti, p. 186, Mexico, *levifrons*, p. 187, Mexico, spp. nn.; notice of *B. aqua*, p. 188. Brocchi, *l. c.*

Bufo melanochlorus, Costa Rica, *canaliferus*, Tehuantepec, Cope, *l. c.* p. 85: spp. nn.

Hylophorbus, g. n. (Opisthogl. Platyd.). Elongate, head small; eyes prominent; nostrils on side of snout, which is prominent; mouth opening beneath; teeth none; internal nostrils almost hidden under projecting snout; tongue not free behind; fingers and toes free and slight, with a small but distinct short transverse disc at their extremities; tympanum visible, but covered with skin; skin smooth; no parotids; ? sacral vertebrae. *H. rufescens*, sp. n., Macleay, *l. c.* p. 136, New Guinea.

Hylarana nebulosa, sp. n., *id. l. c.* p. 137, New Guinea.

Polypedates davidi, sp. n., Sauvage, *l. c.* p. 117, China.

Hyperolius leptosomus, fig. 5, *adpersus*, fig. 6, Peters, *l. c.* p. 619, Chinchoco: spp. nn.

Phyllobates cystignathoides, sp. n., Cope, *l. c.* p. 89, Vera Cruz.

Hyloides bocourti, sp. n., Brocchi, *l. c.* p. 130, Coban.

Platymantis plicifera, Gthr., from Duke of York Island; Günther, P. Z. S. 1877, p. 132.

Litoria guttata, p. 137, *dorsalis*, p. 138, Macleay, l. c., New Guinea: spp. nn.

Lithodytes lanciformis, p. 88, *pelviculus*, p. 89, West Coast of Central America, Cope, l. c.: spp. nn.

Chorophilus verrucosus, p. 87, Florida, *cuzcanus*, p. 37, Peru, the first of the genus from S. America; *id.* l. c., spp. nn.

Hyla. Notes on *H. moreleti*, Dum., *baudini*, D. B., *regilla* and *eximia*, B. & Gir.; & *H. pansosana* and *plicata*, spp. nn., Central America; Brocchi, l. c. pp. 122-128.

Hyla stetzneri, sp. n., Weyenbergh, in Napp's Argentinische Republik, p. 165.

Hyla thesaurensis, sp. n., Peters, l. c. p. 421, Solomon Islands.

Hyla spilomma, p. 86, *bistincta*, p. 87, Vera Cruz, Cope, l. c.: spp. nn.

Pelodytes militarius, Ramsay, from New Guinea; Macleay, l. c. p. 138.

Plectrohyla, g. n. Tympanum not visible: allied to *Euclenemis* and *Microhyla*, but with vomerine teeth and curious conformation of the hand. *P. guatemalensis*, sp. n., P. Brocchi, l. c. p. 92, Guatemala.

Cauphas, g. n., for the above-recorded *Plectrohyla guatemalensis* and *C. crassus*, sp. n., Mexico, *id.* l. c. p. 129.

Callula notosticta, sp. n., Günther, Ann. N. H. (4) xix. p. 316, pl. 16 c, Madagascar.

Grandidier's *Callulae* belong to *Dyscophus*. Note by A. Grandidier, admitting *Dyscophus insularis* to be the young of *Kaloula guineti*, and characterizing *D. insularis* var. n. *antongilii*; Bull. Soc. Philom. (7) i. p. 41.

Dendrobates tinctorius, with peculiar coloration; Brocchi, l. c. p. 194.

Rhinophryne (genus noticed) *rostratus*, sp. n., *id.* l. c. p. 196, Mexico.

BATRACHIA GRADIENTIA.

CHAUVIN, M. v. Ueber das Anpassungsvermögen der Larven von *Salamandra atra*. Z. wiss. Zool. xxix. pp. 324-351, pl. xxii.

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A translation from the Dutch of the author's previous papers.

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Tylotriton verrucosus, Anders., found in Sikkim, the first example of a tailed Batrachian in India; Wood-Mason, P. A. S. B. 1877, p. 53.

Onychodactylus japonicus, Bonap.: complete account of this species; Troschel, Arch. f. Nat. (2) 1877, pp. 199-214, pl. xv. figs. 1-14.

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Menopoma alleghaniense; observations on the shedding of the skin. A. Grote, from an examination of 100 specimens, is of opinion that there is but one species from the tributaries of the Mississippi; P. Am. Ass. 1877, pp. 255-257.

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Proteus anguineus. R. Wiedersheim, Morph. JB. iii. p. 632, refers to F. Schulze's Memoir in Z. wiss. Zool. xxvi., which described the eggs laid by a *Proteus*, and established the fact of its being an oviparous reptile. It would seem that the eggs of *Proteus* closely resemble those of the Axolotl, a short description of which was given by Stieda in SB. Ges. Dorp., 20th March, 1875,

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BY

A. W. E. O'SHAUGHNESSY.

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T. GILL, on the kinds of fish which are found associated with *Meduse*; Nature, xvi. p. 362.

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CLASSIFICATION.

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- GÜNTHER, A. Account of the Fishes collected by Capt. Feilden between 78° and 83° N. lat. during the Arctic Expedition 1875-76. P. Z. S. 1877, pp. 293-295, pl. xxxii. (*Salmo arcturus*, sp. n.).
- Report on a Collection of Fishes made by Mr. C. Hart during the late Arctic Expedition. *Tom. cit.* pp. 475-477, pl. 1. (*Salmo naresi*). 3 species not in Capt. Feilden's list were obtained.

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- LEUTHNER, F. Die Mittelrheinischen Fischfauna, mit besonderer Berücksichtigung des Rheins bei Basel, nebst einer mit kurzen Diagnosen versehenen systematischen Uebersicht zur Bestimmung der Rheinischen Fische. Basel-Genf-Lyon: 1877, 8vo, 59 pp.

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A classified synopsis.

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KESSLER has given interesting information respecting the fauna of Lake Gokcha, situated at a height of 6,419 ft., in the Caucasus. The fishes consist of 5 species, 3 *Salmo*, 1 *Capoeta*, and 1 *Barbus*. Mém. Pétersb. vii. ; *Nature*, xv. p. 438.

Africa.

KOSSMANN, R. Zoologische Ergebnisse einer im Auftrage der königlichen Academie der Wissenschaften zu Berlin ausgeführte Reise in Küstengebiete des Rothen Meeres. Erste Hälfte. Leipzig : 4to, & Verh. Ver. Heidelb. i. p. 375. 1 *Pisces* (34 pp., 2 pls.) by Kossmann & H. Räuber.

A further contribution to the ichthyology of the Red Sea. The number of species collected is given as 80, of which 36 had not been found by Klunzinger : 13 of these latter are described as new to science.

W. PETERS communicates A. Reichenow's account of fishes collected in Chinchoxo and other W. African localities, in which 2 new species are described. *L. c.* pp. 621-624.

East Indies.

BEAVAN, R. Handbook of the Freshwater Fishes of India. London : 1877, 8vo, pp. 247, 12 pls.

BLEEKER, P. Atlas Ichthyologique des Indes orientales Néerlandaises. Parts 33 & 34 (vol. viii. pp. 49-156) ; part 35 (vol. ix. pp. 1-40) ; plates cccxxxi.-ccccx.

The text is occupied with the *Percidæ* continued, *Sparidæ*, *Bogoidæ*, *Cirrhitidæ*, and *Squamipinnes*. The plates are referred to below.

DAY, F. Fishes of India. Part iii. London, 4to, pp. 369-552, pls. lxxix.-cxxxiii.

Embraces the families from *Labyrinthici* to *Cyprinidæ* inclusively in the order of Günther's catalogue.

— Geographical Distribution of Indian Freshwater Fishes. i. The *Acanthopterygii*. Spiny-rayed, Teleostean Fishes. ii. The *Siluridæ*. J. L. S. xiii. pp. 138-154, 338-352.

Statistics compiled with a view to show that the Malayan element predominates greatly over the African.

For partial abstract, see *Nature*, xv. pp. 150.

— On Amphibious and Migratory Fishes of Asia. *Tom. cit.* pp. 198-214.

An account of investigations into the normal direct respiration of atmospheric air in the case of a large number of Asiatic fishes, viz., *Labyrinthici*, *Ophiocephali*, *Siluridæ*, *Amphipnous* ; the respiratory sac of

such fishes is not homologous with the swim-bladder, but probably with that of amphibious reptiles. The writer treats in the second place of the migrations of Indian fishes, dealing with the phenomenon known as 'falling from the clouds' in connection with the amphibious nature of these fishes.

China.

O. F. VON MÜLLENDORFF gives a list of freshwater fishes of the province of Chihli, with their Chinese names; J. N. China Soc. (n.s.) xi. 1877, pp. 105-111.

Japan.

GÜNTHER, A. Preliminary Notes on new Fishes collected in Japan during the Challenger Expedition. Ann. N. H. (4) xx. pp. 433-446.

The 'Challenger' fishes having been entrusted to Dr. Günther for examination; he will publish the diagnoses of the new forms of some of the faunistic districts, in anticipation of the complete account when the plates are executed. This paper is the first of the series, and contains 29 new species and one constituting an entirely new family.

Polynesia.

GÜNTHER, A. Fische der Südsee. VI. J. Mus. Godeffr. xi. pp. 169-216, pls. ci.-cxxx.

Contains the families *Gobiidae*, *Blenniidae*, *Sphyrenidae*, *Atherinidae*, and *Mugilidae*.

MARTENS, E. VON. Die Preussische Expedition nach Ost-Asien. Zoologische Abtheilung. Erster Band. 2te Hälfte. Berlin: 1876, 8vo, pp. 193-412, pls. i.-xv.

Continued after a delay since 1865-1867. This volume contains numerous scattered notices of fishes collected and observed in the Philippines, Siam, Singapore, and the Indian Archipelago, with a complete list of them, pp. 385-410, giving the localities and references to such of the new species as were described between 1864 & 1869 by Peters and other writers, principally in MB. Ak. Berl. In this list a large number of species are still indicated as *inedite*. Pls. v.-xv. are occupied by fishes which will be referred to below, the coloration having been done from fresh specimens.

New Zealand.

HECTOR, J. Notes on New Zealand Ichthyology. Tr. N. Z. Inst. ix. pp. 465-469, pls. viii. & ix., and Ann. N. H. (4) xix. pp. 339-341.

America.

✓ GILL, T., & BRANSFORD, J. F. Synopsis of the Fishes of Lake Nicaragua. P. Ac. Philad. 1877, pp. 175-191.

Introductory remarks on the association of characteristically marine and freshwater types; with a list of the fishes now known as inhabiting Lake Nicaragua, increased to 21 since 1868, when Dr. Günther enumerated 9, and descriptions of several new species which will be recorded below.

JORDAN, D. S. Contributions to North American Ichthyology. No. 1 [Bull. U. S. Nat. Mus. ix.] pp. 1-53.

On the "*Ichthyologia Ohiensis*": lists of the genera, subgenera, and species of Rafinesque, with an attempt to fix their equivalents in modern nomenclature, the identification being the result of three years' study. Part of this paper appears also in Bull. Buff. Soc. iii. pp. 91-97.

— Contributions to North American Ichthyology. No. 2 [Bull. U. S. Nat. Mus. x.] 116 pp. 45 pls.

A.—Notes on *Cottidæ*, *Etheostomatidæ*, *Percidæ*, *Centrarchidæ*, *Aphoderidæ*, *Dorysomatidæ*, and *Cyprinidæ*, with revisions of the genera and descriptions of new or little known species.

B.—Synopsis of the *Siluridæ* of the fresh waters of North America.

— A Partial Synopsis of the Fishes of Upper Georgia, with Supplementary Papers on Fishes of Tennessee, Kentucky, and Indiana. Ann. Lyc. N. York, xi. pp. 307-377.

Descriptions drawn from hundreds of individuals: the new species are recorded below.

— On the Fishes of Northern Indiana. P. Ac. Philad. 1877, pp. 42-82.

—, & COPELAND, H. Check List of the Fishes of the Fresh waters of North America. Bull. Buff. Ac. iii. pp. 133-164.

—, & GILBERT, C. On the Genera of North American Freshwater Fishes. P. Ac. Philad. 1877, pp. 83-104.

A list in chronological order of the genera, based upon species of North American freshwater fishes.

✓ STEINDACHNER, F. Die Süßwasserfische des Südöstlichen Brasiliens. iv. SB. Ak. Wien, lxxvi. pp. 217-230, 2 pls.

WEYENBERGH, H. Algunos nuevos Pescados del Museo Nacional y algunas noticias ictiologicas. Buenos Ayres: 4to, 21 pp. 4 pls.

The same author gives a short notice of the Fishes found in the Argentine States, in R. Napp's "*Die Argentinische Republik*" (Buenos Ayres: 1876, 8vo), pp. 166-169.

YARROW, H. Notes on the Natural History of Fort Macon, N. C., and vicinity. No. 3. P. Ac. Philad. 1877, pp. 203-218.

A continuation of the papers begun by Dr. Cones in 1871; the present is a list of the fishes, with particulars of each species.

E. COPE's "*Synopsis of Fishes of North Carolina*" has been reprinted with some addenda. Philadelphia: 8vo. [See Zool. Rec. viii.]

Fishes collected by Prof. Orton in Peru, 1876-1877, are described by E. COPE, P. Am. Phil. Soc. xvii. pp. 41-49.*

* The Peruvian collections of Prof. Orton (1873-1877) are treated a second time at greater length by E. Cope, *l. c.* pp. 673-701; the catalogue consists of 120 species of fishes from the head streams of the Amazon, a large number being

The same author describes new or little-known Fishes from the Austro-riparian Region, *l. c.* pp. 65-68.

W. PETERS enumerates the Fishes collected by C. Sachs in Venezuela, describing 4 new species, MB. Ak. Berl. 1877, pp. 469-473.

A short notice of the Fishes of Venezuela by A. Ernst, in "Estudios sobre la Flora y Fauna de Venezuela," p. 281.

A new volume of the "Mission Scientifique au Mexique" bears the date 1877, but appears not to have been issued until 1878; the account of it cannot therefore be given here

Cuba.

POEY, F. Enumeratio Piscium Cubensium. Part iv. Addenda, &c., and Index. An. Soc. Esp. vi. pp. 139-154.

Bermudas.

G. B. GOODE has published a Preliminary Catalogue of the Reptiles, Fishes, and Leptocardians of the Bermudas, with descriptions of 4 species of Fishes believed to be new. Am. J. Sci. (3) xiv. pp. 289-298.

Galapagos Islands.

A. GÜNTHER enumerates the Fishes collected by Commander Cookson, of H.M.S. 'Petrel.' P. Z. S. 1877, p. 67.

PALÆICHTHYES.

STOHM, —. Ueber den Klappenapparat im Conus arteriosus der Sclachier und Ganoidei. Morph. JB. ii. pp. 197-228, pls. xii. & xiii.

GANOIDEI.

BACHMAN, J. Ueber Ganoidfischen und ihre Entwicklung. SB. Ges. Bern. 1877, p. 45.

THACHER, J. Ventral Fins of Ganoids. Tr. Conn. Ac. iv. pp. 233-242, pls. i. & ii.

BRIDGE, T. The Cranial Osteology of *Amia calva*. J. Anat. Phys. xi. pp. 605-622, pl. xxiii.

WILDER, B. On the Serrated Appendages of the Throat of *Amia*. P. Am. Ass. xxv. pp. 259-263, plate.

—. On the Tail of *Amia*. L. c. pp. 264-267, plate.

Lepidosteus. B. Wilder, "Gar-Pikes, Old and Young," in Pop. Sci. Month. May & June, 1877, gives a popular account of *Lepidosteus* and other Ganoids. All the long-nosed Gars are referable to *L. osseus*, with measurements of three; Jordan, Ann. Lyc. N. York, xi. p. 353.

new species. This, however, belongs to the second part of the volume, No. 101, which was not printed until March, 1878, and cannot therefore be included in the present Record.—A. W. E.O'S.

Scaphirrhynchus. A third species (*S. kaufmanni*, sp. n.) of this interesting genus was made known in 1875 by Bogdanov in a work printed in Russian, entitled "Sketches of Nature in the Oasis of Khiva," and noticed further by Kessler in Aralo-Caspian Expedition, iv. p. 194. It has been found at present only in the Amu-Daria, and does not occur in the Aral Sea as far as is yet known. A fourth species, named *S. hermanni* by Severtzoff, is now described by Kessler for the first time, *op. cit.* p. 190, Amu-Daria, Khiva. Both species are figured, figs. 25 & 26.

Polyodon (Psephurus) gladius, Martens, figured by E. von Martens, Preuss. Exped. Ost-Asien, i. 2te Hälfte, pl. xv. fig. 1.

CHONDROPTERYGII.

BALFOUR, J. On the Development of Elasmobranch Fishes. *J. Anat. Phys.* xi. pp. 128-172, pls. v. & vi., pp. 406-490, pls. xv.-xix., pp. 674-706, pls. xxiv. & xxv. (continued from x. p. 688).

HOLOCEPHALA.

HUBRECHT, A. Notiz über einige Untersuchungen am Kopfskelet der Holocephalen. *Morph. JB.* iii. pp. 280-282.

WILDER, B. On the Brain of *Chimera monstrosa*. *P. Ac. Philad.* 1877, pp. 219-250, pl. i.

Chimera plumbea, sp. n., Gill, *Bull. Phil. Soc. Washington*, see *Ann. N. H.* (5) i. p. 183; La Have Bank, lat. 42° 40' N., long. 62° 23' W.

PLAGIOSTOMATA.

GARMAN, S. On the Pelvis and External Sexual Organs of Selachians, with special reference to the new genera *Potamotrygon* and *Disceus*. *P. Bost. Soc.* xix. pp. 197-214.

SELACHOIDEI.

Carcharias munzingeri, sp. n., Kossmann & Räuber, *Reise Roth. M.* p. 31, Red Sea.

Eulamia nicaraguensis, sp. n., Gill & Bransford, *P. Ac. Philad.* 1877, p. 190, Lake Nicaragua.

Mustelus mentô, sp. n., Cope, *P. Am. Phil. Soc.* xvii. p. 47, Peru.

Selache maxima. Du Bocage (Les fanons branchiaux du Squalo Pélerin, *J. Sc. Lisb.* 1877, pp. 71-73, and *Nature*, xvi. p. 61) claims the priority of accurately describing these organs for F. Brito-Capello [see *Zool. Rec.* vi.], as anterior to Steenstrup [see *Zool. Rec.* x. p. 105]. G. Allmann, *Nature*, xiv. p. 368, writes that he described the pectinated appendages more than thirty years ago. Referring to a description of the 'Basking Shark' with figures by E. P. Wright, *Nature*, xiv. p. 313, E. H. Giglioli writes, *l. c.* xv. p. 273, calling attention to P. Pavesi's memoir [see *Zool. Rec.* xii. p. 109]. Further letter from E. P. Wright

l. c. xv. p. 292. [A still later and most elaborate memoir by P. Pavesi bears date 1878.]

Centrophorus squamosus and *foliaceus*, Günther, Ann. N. H. (4) xx. p. 433, Japan, spp. nn.

BATOIDEI.

MALM, A. Bidrag till Kännedom om utvecklingen af Raja. Öfv. Ak. Förh. xxxiii. 3, pp. 91-101.

Rhinobatus halavi, Rp. Notes on this species, which is probably identical with *R. undulatus*; Kossmann & Räuber, *l. c.* p. 32.

Torpedo. On the electric discharge; Marey, C. R. lxxxiv. pp. 190-192 and 354-356. On the terminations of the nerves in the electric apparatus; C. Rouget, C. R. lxxxv. pp. 485-487.

Raja (Malacorrhina) mira, Garman, P. Bost. Soc. xix. p. 207, Mejillones; *R. isotrachs*, Günther, Ann. N. H. (4) xx. p. 434, Japan: spp. nn.

Psammobatis brevicaudatus, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 48, Peru.

Sympterygia acuta, sp. n., Garman, *l. c.* p. 206, Buenos Ayres.

Disceus, g. n., for *Trygon stronglylopterus*, Schomb.; Garman, *l. c.* p. 208.

Potamotrygon, g. n., for *Trygon hystrix*, M. & H., *T. motoro*, M. & H., and *Ellipesus spinicauda*, Schomb. *Id. l. c.* p. 210.

Myliobatis tenuicaudatus, sp. n., Hector, Tr. N. Z. Inst. ix. p. 468, pl. x. New Zealand.

TELEOSTEI.

ACANTHOPTERYGII.

PERCIDÆ.

Boleichthys eos, sp. n., Jordan & Copeland, P. Ac. Philad. 1877, p. 46, Wisconsin, &c.

Etheostoma nigrum, Raf.: synonymy, Jordan, *l. c.* p. 48. *E. squamiceps*, sp. n., *id.* Bull. Nat. Mus. x. p. 11, Kentucky.

Alvordius (Etheostoma) phoxocephalum, sp. n., Nelson, Bull. Illinois Mus. i. [1876]; Illinois, redescribed, p. 50. *Etheostoma blennioides*, Kirtl., renamed *Alvordius aspro*, p. 51; *A. evides*, sp. n., p. 51, Indiana: Jordan, P. Ac. Philad. 1877.

Ericosoma, g. n., for *Alvordius evides*, separated from *Alvordius*; *id.* Bull. Nat. Mus. x. p. 8.

Percina manitou, sp. n., *id.*, P. Ac. Philad. 1877, p. 53, Indiana.

Comparison of *Etheostomoid* genera; *id. l. c.* pp. 54-56.

Analysis of genera and catalogue of species; *id.*, Bull. Nat. Mus. x. pp. 12-19.

Hadropterus nigro-fasciatus, Agass., redescribed; *id.*, Ann. Lyc. N. York, xi. p. 310.

Boleosoma stigmæum, sp. n., *id. tom. cit.* p. 311, Upper Georgia.

Ammocrypta, g. n. Allied to *Pleurolepis*, Ag. Body greatly elongated,

subcylindrical and translucent; head as in *Pleurolepis*, but entirely naked; body entirely naked excepting caudal peduncle, which is sparsely covered with thin imbedded scales, and a series of rather large scales along the sides, on which the lateral line runs; upper jaw somewhat protractile; mouth rather wide, nearly terminal; a single anal spine. *A. beuni*, sp. n., *id.*, Bull. Nat. Mus. x. p. 5, Louisiana.

Nanostoma (Putn. MSS.), g. n., characterized, for *Pæcilichthys zonalis*, Cope; *id.* l. c. p. 6.

Hadropterus tessellatus, sp. n. (or *Boleosoma tessellatum*, Thomps.), *id.* l. c. p. 7.

Rheocrypta, g. n., allied to *Imostoma* and *Alwordius*. Body rather slender and elongate, with pretty large, rather long, and somewhat narrow head, like *Boleosoma*; mouth small, horizontal sub-inferior, with weak teeth in jaws, 5 or 6 teeth on vomer, none on palatines; upper jaw protractile, separated by distinct furrow from forehead; 2 distinct dorsals, second rather smaller than first and anal, anal spines 2; ventral region with a series of enlarged plates, caducous, or replaced by a scaleless strip; cheeks naked; opercles with a few scales; lateral line complete. *R. copelandi*, sp. n., *id.* l. c. p. 9, Indiana.

Arlina atripinnis, sp. n., *id.* l. c. p. 10, Tennessee.

[*Lucioperca*] *Stizostethium*. Synonymy and descriptions of the American species; *id.* l. c. pp. 43-49.

Anthias richardsoni, Gthr., = *Perca lepidoptera*, Forst.; Hutton, Tr. N. Z. Inst. ix. p. 353.

Serranus olfax, Jen., redescribed; A. Günther, P. Z. S. 1877, p. 67.

Pseudoserranus bicolor, sp. n., Kossmann & Räuber, Reise Rothen Meer, i. p. 7, pl. i. fig. 1, Red Sea.

Mesoprion. Diagnoses of the Indo-pelagic species; Bleeker, Atl. Ichth. viii. pp. 49-76.

Ambassis. Diagnoses of Indo-pelagic species, *id.* op. cit. pp. 131-140.

Copelandia, g. n., allied to *Enneacanthus*, *Hemioplites*, and *Centrarchus*. D. 10 spines, A. 4 spines, strong, soft rays high; caudal rounded; opercle emarginate, with black dermal border, a supernumerary maxillary bone; palatine teeth, appendages of anterior gill-arch long, and in small number. *C. eriarcha*, sp. n., Jordan, P. Ac. Philad. 1877, p. 56, Wisconsin.

Comparison of Centrarchine genera; *id.*, l. c. pp. 58-60, & 77.

Analysis, lists, and descriptions; *id.*, Bull. Nat. Mus. x. pp. 20-43.

Eupomotis, substituted for *Pomotis*, Gill & Jordan, "Field and Forest," 1877, ii. p. 190; Jordan, l. c. p. 20.

Helioperca, g. n., for *Pomotis incisor*, C. V.; *id.*, Ann. Lyc. N. York, xi. p. 355.

Xenotis, g. n., separated from *Lepiopomus* by character of gill-rakers, which are short, comparatively thick, soft, cartilaginous or unossified base, nearly destitute of teeth; *id.*, P. Ac. Philad. 1877, p. 76, and Bull. Nat. Mus. x. p. 21. Species described, *id.* l. c. pp. 22, 23, 40-42. *Ichthelis sanguinolentus*, Jord. (identified with *I. aurita*, Raf.), renamed *X. lythrochloris*, and *I. macrochira*, Jord., renamed *X. aureolus*; *id.* Bull. Nat. Mus. ix. & x. pp. 40-41.

Xystroplites, g. n., supernumerary maxillary bone absent; teeth of lower pharyngeal blunt and paved, gill-rakers long and rather slender. *X. gilli*, sp. n., Jordan, l. c. p. 24, Florida. *X. longimanus*, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 69, Florida.

Ichthelis aquilensis, Nelson (nec *P. aquilensis*, Grd.) renamed *Lepiopomus ischyurus*; Jordan, l. c. p. 25.

Lepomis apiatus, Cope, P. Am. Phil. Soc. xvii. p. 66, and Jordan, l. c. p. 25; *L. mystacalis*, Cope, l. c. p. 66, Florida: spp. nn.

Lepiopomus miniatus, sp. n., Jordan, l. c. p. 26, Louisiana.

Apomotis phenax, sp. n., *id. ibid.*, New Jersey.

Enneacanthus pinniger, sp. n., p. 27; *E. obesus*, Jdn., described and renamed *E. margarotis*, p. 28; the several species contrasted, p. 30: *id. l. c.*

Chilodipterus affinis, sp. n., Poey, Ann. Lyc. N. York, xi. p. 58, Cuba.

Histioporus typus, Schleg., from the Austro-Malayan region; Günther, P. Z. S. 1877, p. 132.

(*Synagris*) *Dentex*: synopsis and diagnoses of Indo-pelagic species, pp. 81-95; (*Dentex*) *Gymnocranius* and *Pentapus*, diagnoses, pp. 97-104; other Indo-pelagic genera and species, pp. 104-122; and *Gerres*, diagnoses of 12 species, pp. 123-129: Bleeker, *op. cit.* viii.

Diagramma ornatum, sp. n., Kossmann & Räuber, l. c. p. 10, pl. i. fig. 3, Red Sea; notes on *D. griseum*, C. V., and profile figured, fig. 2.

Hapalogenys atlanticus, sp. n., Reichenow, MB. Ak. Berl. 1877, p. 621, Chinchoxo.

Datnioides microlepis, Blkr., figured and noticed; E. von Martens, Die Preuss. Expedition, p. 307, pl. v.

Gymnocaesio, g. n. for *Caesio gymnopterus*, Blkr.; Bleeker, Atl. Ichth. viii. p. 34.

Liocaesio, g. n. for *Caesio cylindricus*, Gthr., *id. Versl. Ak. Amst.* (2) ix. [1876] p. 153.

SQUAMIPINNES.

BLEEKER, P. Atlas Ichthyologique. Vol. ix., livr. 35. Diagnoses of *Chatodontidae*, pp. 1-40.

—. Révision des espèces insulindiennes de la famille des Chatodontoides. Verh. Ak. Amst. xvii. 169 pp.

—. Notice sur la sous-famille des Holacanthiformes et description de quelques espèces insuffisamment connues. Arch. Néerl. (6) xii. pp. 17-37, pl. ii.

Chatodon klunzingeri, sp. n., Kossmann & Räuber, l. c. p. 13, pl. ii. fig. 11, Red Sea.

Chatodon tau-nigrum, C. V., = *vittatus*, Bl. Schw., = *trifasciatus*, Mungo Park, p. 35; *guttatissimus*, Benn., = *citrinellus*, Brouss., = *miliaris*, Q. G., p. 39; *multicinctus*, Gthr., = *punctato-fasciatus*, C. V., p. 40: Bleeker, Atl. Ichth. ix.

[*Holacanthus*] *Acanthochatodon alternans*, C. V., figured by Bleeker, Arch. Néerl. xii. pl. ii.

Toxotes microlepis, Gthr., *chatareus*, Blkr., *oligolepis*, Blkr., *jaculator*, C. V.; diagnoses, *id.*, Atl. Ichth. ix. pp. 1-4.

NANDIDÆ.

Plesiops oxycephalus, Blkr., pl. cccxxxix. fig. 7, *nigricans*, Rüpp., pl. cccxc. fig. 3, figured; Bleeker, *tom. cit.*

Nandus nebulosus, Blkr., fig. 1, *Pristolepis grooti*, Blkr., fig. 2, *P. fasciatus*, Blkr., fig. 4, figured; *id. tom. cit.* pl. cccxc.

MULLIDÆ.

The following are figured by Bleeker, *tom. cit.*:—*Parupeneus macronema*, Blkr., pl. cccxc. fig. 3, *pleurospilus*, Blkr., fig. 5, *Upeneus moluccensis*, Blkr., pl. cccxcii. fig. 1, *tragula*, Rich., fig. 2, *vittatus*, C. V., fig. 3, *Parupeneus janseni*, Blkr., fig. 4, *barberinoides*, Blkr., fig. 5, *Mulloides vanicolensis*, Blkr., fig. 6, *Parupeneus barberinus*, Blkr., pl. cccxciii. fig. 1, *cherseydros*, Blkr., fig. 2, *pleurostigma*, Blkr., fig. 3, *Upeneus sulphureus*, C. V., fig. 4, *Parupeneus xanthospilurus*, Blkr., fig. 5, *luteus*, Blkr., pl. cccxciv. fig. 1, *Upeneus sundaicus*, Blkr., fig. 2, *Mulloides flavo-lineatus*, Blkr., fig. 3, *Parupeneus multifasciatus*, Blkr., fig. 4, *indicus*, Blkr., fig. 5.

Upeneichthys vlamingi, C. V., redescribed and figured; Hector, Tr. N. Z. Inst. ix. p. 465, pl. ix. fig. 5, & Ann. N. H. (4) xix. p. 340.

SPARIDÆ.

Girella percoides, Hect., = *G. simplex*, Rich.; Hector, l. c. p. 468, pl. viii. fig. 6 c.

Chrysophrys datnia. Stomach and cæcal appendages figured; Day, F. Ind. p. 375.

Pimelepterus cinerascens, Day (*tahmel*, Rüpp.), p. 15, *ternatensis*, Blkr., = *lembus*, C.V., *oblongior*, C.V., p. 16, and *waigiensis*, Q. G., p. 17, diagnoses; Bleeker, Atl. Ichth. ix.

CIRRHITIDÆ.

Diagnoses of 9 species of this family; Bleeker, *op. cit.* viii. pp. 141–148.

Chironemus fergussoni, Hect., redescribed and figured; Hector, l. c. p. 467, pl. viii.

Latris arosa, sp. n., Hutton, Tr. N. Z. Inst. ix. p. 353, N. Zealand. *L. hecateia*, Rich., = *Mendosoma lineatum*, Gay; *id. ibid.* [The Recorder does not agree with this identification.]

SCORPÆNIDÆ.

Holoxenus, Gthr., = *Gnathanacanthus*, Blkr. (1855), which belongs to *Scorpenidæ* not *Cirrhitidæ*; Bleeker, Versl. Ak. Amst. (2) xi. p. 132.

Sebastes macrochir and *oblongus*, spp. nn., Günther, Ann. N. H. (4) xx. pp. 434 & 435, Japan.

Scorpena miostoma, sp. n., *id.* l. c. p. 435, Japan.

Tetraroge gallus, sp. n., Kossmann & Räuber, l. c. p. 15, pl. ii. fig. 6, Red Sea.

BERYCIDÆ.

Melamphaes megalops, sp. n., C. Lütken, Overs. Dan. Selsk. 1877, p. 176, pl. v. figs. 1-3, Atlantic (sub-tropical), found in stomach of a *Coryphæna*.

Anoplogaster cornutus, Val., described; *id. l. c.* pp. 181-186, pl. v. figs. 4-7.

Beryx affinis, Gthr., noticed; Hector, Ann. N. H. (4) xix. p. 341.

Polymixia japonica, sp. n., Günther, Ann. N. H. (4) xx. p. 436, Japan.

KURTIDÆ.

Pempheris: revision of the species. *P. mangula*, Gthr., in F. der Süds., = *adustus*, Blkr.; Bleeker, Arch. Néerl. (6) xii. pp. 42-54. Figures of *P. adustus*, Blkr., fig. 1, *mangula*, C. V., fig. 2, *schwenki*, Blkr., fig. 3, *otaitensis*, C. V., fig. 4, *ovalensis*, C. V., fig. 5, *vanicolensis*, C. V., fig. 6, pl. cccclxxxiii.; diagnoses, pp. 6-8, Bleeker, Atl. Ichth. ix.

Pempheris rhomboideus, sp. n., Kossmann & Räuber, *l. c.* p. 18, pl. i. fig. 4, Red Sea.

POLYNEMIDÆ.

Polynemus multifilis, Schleg., figured by Martens, *l. c.* p. 309, pl. vi.

SCIENIDÆ.

SAUVAGE, E. Sur les écailles de la ligne latérale chez les Scienoides. Bull. Soc. Philom. (7) i. pp. 154-159.

Figures of the following species issued by Bleeker, *tom. cit.*:—*Otolithus lateoides*, Blkr., pl. cccclxxxiv. fig. 1, *Johnius hypostoma*, Blkr., fig. 2, *Otolithus maculatus*, K. v. H., fig. 3, *Pseudosciæna polycladiscus*, Blkr., fig. 4, *Sciæna macropterus*, Blkr., fig. 5, *Pseudosciæna plagiostoma*, Blkr., pl. cccclxxxv. fig. 1, *aneus*, Blkr., fig. 2, *miles*, Blkr., fig. 3, *borneensis*, Blkr., fig. 4, *Otolithus argenteus*, K. v. H., fig. 5, *Johnius trachycephalus*, Blkr., pl. cccclxxxvi. fig. 1, *Sciæna russelli*, Blkr., fig. 2, *Sciænoides bi-auritus*, Blkr., fig. 3, *Pseudosciæna vogleri*, Blkr., fig. 4, *goldmani*, Blkr., fig. 5, *Johnius belengeri*, Cant., pl. cccclxxxvii. fig. 1, *novæ-hollandiæ*, Blkr., fig. 2, *Pseudosciæna microlepis*, Blkr., fig. 3, *Sciæna dussumieri*, Blkr., fig. 4, *Johnius jubatus*, Blkr., fig. 5, *Pseudosciæna diacanthus*, Blkr., pl. cccclxxxviii. fig. 2, *Sciænoides microdon*, Blkr., fig. 5.

TRICHIURIDÆ.

Lepidopus tenuis, sp. n., Günther, Ann. N. H. (4) xx. p. 437, Japan.

CARANGIDÆ.

Caranx cheverti, *laticaudus*[-da], *papuensis*, *bucculentus*, and *edentulus*,

spp. nn., Alleyne & Macleay, P. Linn. Soc. N. S. W. pp. 324-327, pls. x. figs. 1-3, & xi. figs. 1 & 2, New Guinea.

Platax batavianus, C. V. (*arthriticus*, Bell), pl. cccclxxxi, *teira*, C., pl. cccclxxxii. fig. 1, *pinnatus*, Blkr., fig. 2; figured by Bleeker, *tom. cit.*

CYTTIDÆ.

Platystethus abbreviatus, Hect., is a *Cyttus*; Hector, *l. c.* p. 467.

CORYPHÆNIDÆ.

Toxotes squamosa, Hutton, is a *Brama*; Hector, *l. c.* p. 465, pl. ix. & Ann. N. H. (4) xix. p. 340.

NOMEIDÆ.

Nomeus gronovii, Gmel. [*mauritiæ*, Cuv.], figured; Martens, *l. c.* pl. xv.

TRACHINIDÆ.

Figures of the following species issued by Bleeker, *tom. cit.*:—*Pseudochromis xanthochir*, Blkr., pl. cccclxxxviii. fig. 1, *fuscus*, M. Tr., fig. 4, *Sillago macrolepis*, Blkr., pl. cccclxxxix. fig. 1, *chondropus*, Blkr., fig. 2, *Pseudogramma polyacanthus*, Blkr., fig. 3, *Sillago sihama*, Rüpp., fig. 4, *maculata*, Q. G., fig. 5, *japonica*, Schl., fig. 6, *Pseudochromis* (*Leptochromis*) *tapeinosoma*, Blkr., pl. cccxc. fig. 1, *Cichlops trispilus*, Blkr., fig. 2, *Cichlops hellmuthi*, Blkr., fig. 4, *melanotenidia*, Blkr., fig. 5, *Pseudochromis* (*Leptochromis*) *cyantotenidia*, Blkr., fig. 6, *melanotenidia*, Blkr., fig. 7, *Cichlops cyclophthalmus*, M. Tr., fig. 8, *spilopterus*, Blkr., fig. 9.

BATRACHIDÆ.

Batrachus congicus, sp. n., Reichenow, *l. c.* p. 622, Chinchoxo.

COTTIDÆ.

Cottus quadricornis, L., in lat. 82° 30'; Günther, P. Z. S. 1877, p. 293.

Potamocottus zopherus, sp. n., Upper Georgia. *P. meridionalis*, *carolinae*, *alvordi*, and the present may prove to be but one species. Jordan, Ann. Lyc. N. York, xi. p. 320.

Cottopsis sicci, sp. n., Nelson, Bull. Illin. Mus. 1876, Lake Michigan; redescribed, Jordan, P. Ac. Philad. 1877, p. 61. Probably = *Uranidea pilota*, Cope; Jordan, Bull. Nat. Mus. x. p. 5.

Uranidea hoyi (Putnam, MS.), Nelson, Bull. Illin. Mus. 1876, p. 41, and *U. kumlieni*, id. *l. c.*, Lake Michigau, spp. nn.; redescribed by Jordan, P. Ac. Philad. 1877, pp. 63 & 64.

Platycephalus rudis, sp. n., Günther, Ann. N. H. (4) xx. p. 436, Japan.

DISCOBOLI.

✓ *Cyclopterus spinosus*, Müll., from Cape Napoleon and Franklin-Pearce Bay, the development of the spines shown, figs.; Günther, P. Z. S. 1877, p. 293.

GOBIIDÆ.

✓ *Gillichthys mirabilis*, Cooper. On specimens of this fish; W. Lockington, Am Nat. xi. pp. 474-478.

Gobius genivittatus, C. V., pl. xc. fig. c; [*h*] *oplopomus*, C. V., pl. xc. fig. b; *puntangoides*, Blkr., pl. cviii. fig. a; *ornatus*, R., pl. cxi. fig. a; *albo-punctatus*, C. V., pl. cx. fig. a; *semidoliatus*, C. V., pl. cix. fig. h; *echinocephalus*, R., pl. cviii. fig. d; *caninus*, C. V., pl. cix. fig. c; *brevifilis*, Day, pl. cviii. fig. g; *leucostictus*, Gthr., pl. cviii. fig. f; *ocellaris*, Brouss., pl. cviii. fig. c; *crassilabris*, Gthr., pl. cviii. fig. b; *phalena*, C. V., pl. cxi. fig. c: noticed, with rectifications of synonymy, and figured by Günther, F. der Südsee, pp. 170-179.

Gobius graffi, p. 179, Namusi, *neophytus*, p. 174, pl. cviii. fig. e, Tahiti, *notospilus*, p. 173, pl. cix. fig. b, Namusi, Günther, l. c.; *G. yokohamæ*, id., Ann. N. H. (4) xx. p. 437, Japan; *G. darnleyensis*, p. 331, pl. xii. fig. 1, *nigripinnis*, p. 332, pl. xii. fig. 2, Alleyne & Macleay, P. Linn. Soc. N. S. W. 1877, Darnley and Palm Islands: spp. nn.

Gobius, *Gobiosoma*, *Benthophilus*. The following are described by Kessler from the Aralo-Caspio-Pontine region, op. cit.:—

Gobius blennioides, p. 12, fig. 4; *semipellucidus*, p. 15; *bathybius*, p. 17, fig. 3; *eurystomus*, p. 22, fig. 2; *burmeisteri*, p. 26, fig. 5; *macrophthalmus*, p. 26, fig. 6; *nigro-notatus*, p. 31, fig. 7; *lenkoranicus*, p. 34; *longicaudatus*, p. 35, fig. 8: spp. nn.

Gobius cyrius, Kessl., description corrected and supplemented, p. 20.

Gobiosoma caspium, sp. n., p. 38, fig. 9.

Benthophilus leptcephalus, p. 45; *ctenolepidus*, p. 48, fig. 11; *spinosus*, p. 50; *bari*, p. 52, fig. 10; *leptorrhynchus*, p. 56, fig. 2; *granulosus*, p. 57, fig. 14; *grimmi*, p. 59, fig. 13: spp. nn.

Euctenogobius ophthalmonema, Blkr., noticed and figured; Günther, F. der Südsee, p. 180, pl. cxi. b.

Apocryptes lineatus, sp. n., Alleyne & Macleay, l. c. pl. xii. fig. 3, Cape Grenville.

Gobiodon verticalis, sp. n., iid. l. c. p. 333, pl. xii. fig. 4, New Guinea.

Gobiodon rivulatus, R., p. 180, pl. cix. f, g; *citrinus*, R., p. 181, pl. cix. e; *ceramensis*, Blkr., p. 182, pl. cix. d: figured and noticed by Günther, l. c. tom. cit.

Gobiodon punctatus, sp. n., Kossmann & Räuber, l. c. p. 19, pl. ii. fig. 7, Red Sea.

Sicydium griseum, sp. n., F. Day, J. L. S. xiii. p. 140, South Canara.

Sicydium lagocephalum, Kner, as *S. tenuum*, Gthr., separated from *S. macrostetholepis*, Blkr., noticed and figured, p. 183, pl. cxii. c.; and

S. albo-teniatus, sp. n., Sandwich Islands, p. 183, pl. cx. d: Günther, *tom. cit.*

Periophthalmus australis, Casteln., figured; Alleyne & Macleay, *l. c.* pl. xi. fig. 3.

Eleotris elongata, sp. n., *iid. l. c.* p. 334, pl. xiii. fig. 1, Darnley Island.

Eleotris ophiocephalus, C. V., p. 185, pl. cxii. a; *macrolepidotus*, Bl., p. 186, pl. cxii. b; *guentheri*, Blkr., p. 186, pl. 113 a; *semipunctatus*, R., p. 187, pl. cxi. d; *strigata*, Brouss., p. 190, pl. cxi. e, noticed and figured; *E. godeffroyi*, sp. n., Society Islands, p. 188, pl. cxxii. b: Günther, *tom. cit.*

Callionymus cookii, Gthr., pl. cxiii. b, figured; *C. microps*, sp. n., Tonga, p. 192, pl. cxiii. c; *id. tom. cit.*

BLENNIIDÆ.

Anarrhichas. On the species *A. lupus*, L., *minor*, Olafs., and *latifrons*, Stp.; diagnoses and revision of synonymy. J. Steenstrup, Vid. Medd. 1876, p. 159, pl. iii.

Blennius tetranemus, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 42, Peru.

Blennius sordidus, Benn., p. 193, pl. cxiii. d; *cristatus*, L., p. 194, pl. cxiii. e, noticed and figured: Günther, *tom. cit.*

Blennius cyclops, Rp., *guttatus*, and *punctatus*, varr. nn., Kossmann & Räuber, *l. c.* p. 21, Red Sea.

Petroscirtes tapiosoma, Blkr., p. 195, pl. cv. d; *rhinorrhynchus*, pl. cv. e; *teniatus*, Q. G., pl. cxiv. a; *filamentosus*, C. V., p. 196, pl. cxiv. b; *lineolatus*, Kn., p. 197, pl. cxv. a; *grammistes*, C. V., pl. cxv. f; *atro-dorsalis*, Gthr., p. 198, pl. cxv. b: noticed and figured. *P. ater*, sp. n., Otaheiti, p. 199, pl. cxv. c; Günther, *tom. cit.*

Petroscirtes petersi, sp. n., Kossmann & Räuber, *l. c.* p. 21, pl. ii. fig. 9, Red Sea.

Salarias niger, sp. n., *iid. l. c.* p. 21, pl. ii. fig. 8, Red Sea.

Salarias tridactylus, Bl., p. 200, pl. xvii. c, d; *nitidus*, Gthr., pl. xiii. f, g; *fasciatus*, Bl., p. 201, pl. cxv. h; *fuscus*, R., p. 202, pl. cxvi. c; *brevis*, Kn., p. 203, pl. cxviii. c; *variolosus*, C. V., pl. cxvi. a; *marmoratus*, Benn., p. 204, pl. cxvi. b; *albo-guttatus*, Kn., p. 205, pl. cxviii. b; *gibbifrons*, Q. G., pl. cxiv. c; *coronatus*, Gthr., p. 206, pl. cxvi. e; *edentulus*, Bl., pl. cxvii. a; *periophthalmus*, C. V., p. 207, pl. cxiv. d, e; *meleagris*, C. V., p. 208, pl. cxvi. d; *quadricornis*, C. V., p. 209, pl. cxvii. b: noticed and figured. *S. aneitensis*, p. 205, pl. cxviii. a, Aneiteum; *caudo-lineatus*, p. 209, pl. cxvi. f, Otaheiti: spp. nn.; Günther, *tom. cit.*

Salarias lineolatus, p. 336, pl. xiii. fig. 2, Darnley Island; *geminatus*, fig. 3, Torres Straits; *irroratus*, p. 337, fig. 4, Low Island; *filamentosus*, pl. xiv. fig. 1, Cape York; *auridens*, p. 338, fig. 2; *cristiceps*, fig. 3, Darnley Island: Alleyne & Macleay, *l. c.*, spp. nn.

Clinus fortidentatus, sp. n., Cope, *l. c.* p. 42, Peru.

Tripterygium minutum, sp. n., Günther, *tom. cit.* p. 211, pl. cxviii. d, Apia.

MASTACEMBELIDÆ.

Mastacembelus argus, Gthr., figured; Martens, *l. c.* pl. x. fig. 4.

SPHYRÆNIDÆ.

Sphyræna forsteri, C. V., p. 211, pl. cxix. A; *obtusata*, C. V., fig. B: noticed and figured; Günther, *tom. cit.*

ATHERINIDÆ.

⁴ *Atherina harringtonensis*, sp. n., Goode, Am. J. Sci. (3) xiv. p. 297, Bermudas.

Atherina lacunosa, Forst., noticed and figured; Günther, *tom. cit.* p. 213, pl. cxviii. E.

MUGILIDÆ.

Mugil dobula, Gthr., p. 214, pl. cxx. A; *kelaarti*, Gthr., p. 215, pl. cxxi. A; *waigiensis*, Q. G., p. 218, pl. cxxi. B; *axillaris*, C. V., pl. cxx. B: noticed and figured. *M. kandavensis*, sp. n., p. 215; Günther, *tom. cit.*

Mugil delicatus, sp. n., Alleyne & Macleay, l. c. p. 341, pl. xv. fig. 1, Cape York.

GASTEROSTEIDÆ.

Gasterosteus pungitius, L., and *aculeatus*, L. Particulars of variations in length of the ventral spine; with remarks on the presence or absence of ventral fins as affording no character in this genus. F. Day, J. L. S. xiii. pp. 110-114.

Gasterosteus platygaster, Kessl. On this species and its varieties; Kessler, *op. cit.* p. 1.

Eucalia, g. n. for *Gasterosteus inconstans*, Kirtl., and *cayaga*, subsp. n., Jordan, P. Ac. Philad. 1877, p. 65.

GobiæSOCIIDÆ.

Sicyæses pyrrhocinclus, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 43, Peru.

OPHIOCEPHALIDÆ.

Ophiocephalus. Figures of 12 species, Bleeker, *tom. cit.* pls. cccxcvii.-cccxcix.; and of *O. argus*, Cantor, and *micropeltis*, K. H., Martens, l. c. pl. vii.

LABYRINTHICI.

Figures of the Indo-pelagic species; Bleeker, *tom. cit.* pls. cccxcv. & cccxcvi.

Polyacanthus cupanus, C. V., figured; Day, *tom. cit.* pl. lxxviii. fig. 4.

Trichogaster chuna, H. B., figured, pl. lxxix. fig. 3, *T. unicolor*, C. V., = *lalius*, H. B., figured, p. 375, pl. lxxix. fig. 5; *T. labiosus*, sp. n., p. 374, pl. lxxix. fig. 4, Burma. *Id. tom. cit.*

LUCIOCEPHALIDÆ.

Luciocephalus pulcher, Gray, figured; Martens, l. c. pl. x. v. fig. 3.

APHREDODERIDÆ.

D. Jordan considers the proper etymology of this name to be *Aphoderide*; Bull. Nat. Mus. x. p. 52.

Sternotremia, g. n., Nelson, Bull. Mus. Illin. 1876, altered to *Asternotremia*; its distinction from *Aphoderus* consisting in the vent being placed, not in the 'sternon,' but entirely behind it. *A. mesotrema*, sp. n., Georgia, Jordan, l. c. x. pp. 51 & 52.

Aphoderus cookianus, sp. n., Jordan, P. Ac. Philad. 1877, p. 60, and Bull. Nat. Mus. x. p. 52, Indiana, Illinois.

ELASSOMINÆ (Subfam. n.).

Elasso[so]ma, g. n. Form, and to some extent aspect of *Aphoderus*, but more compressed; fins small; dorsal with 5 spines; anal with 3; ventrals distinct, thoracic, each with one small spine and 5 soft rays; branchiostegals apparently 5; mouth small, oblique, lower jaw longest, each jaw apparently with a single row of large conical teeth, no vomerine teeth (?); cheeks and opercles scaly; no visible lateral line; branchiostegal membrane broadly united across pectoral region; caudal truncate; vent normal. Type, *E. zonata* [-tum], sp. n., Jordan, Bull. Nat. Mus. x. p. 50, Arkansas and Texas.

It being impossible to determine the character of the pharyngeal bones, this genus cannot at present be referred to its proper family; it possibly however, belongs to the *Cichlidae*.

NOTACANTHI.

Notacanthus. On the species, with particular notice of *N. nasus*, Bl.; C. Lütken, Vid. Medd. 1877, pp. 145-153.

ACANTHOPTERYGII PHARYNGOGNATHI.

POMACENTRIDÆ.

BLEEKER, P. Notice sur les espèces nominales des Pomacentroïdes de l'Inde Archipélagique. Arch. Néerl. (6) xii. pp. 38-41.

The merely nominal species being subtracted, there remain 82 or 83 species in the Indian Archipelago.

Figures of the following are issued by Bleeker in Atl. Ichth. vol. ix. (livr. 35):—*Prochilus ephippium*, pl. cccci. figs. 1 & 9; *Dischistodus annulatus*, fig. 2, *bifasciatus*, fig. 3, *notophthalmus*, fig. 4, and pl. ccccii. fig. 4; *Prochilus macrostoma*, fig. 5, *polylepis*, fig. 6, *melanopus*, fig. 7; *Dischistodus fuscatus*, Gill, fig. 8; *Glyphidodon ternatensis*, pl. ccccii. fig. 1; *Prochilus rosenbergi*, fig. 2; *Pomacentrus moluccensis*, fig. 3; *Chromis*

xanthochir, fig. 5; *Pomacentrus melanopterus*, fig. 6; *Premnas bi-aculeatus*, fig. 7; *Glyphidodon batjanensis*, fig. 8; *Paraglyphidodon bonang*, pl. ccciii. fig. 1; *Chromis lepidolepis*, fig. 2, *insulindicus*, fig. 3, *ternatensis*, fig. 4; *Eupomacentrus lividus*, fig. 5, *albo-fasciatus*, fig. 6; *Chromis lepisurus*, fig. 7, *amboinensis*, fig. 8; *Glyphidodontops modestus*, fig. 9; *Lepidozygus tapinosoma*. Gthr., pl. ccciv. fig. 1; *Paraglyphidodon oxyodon*, fig. 2, *xanthonotus*, fig. 3, *melas*, fig. 4; *Dischistodus trimaculatus*, fig. 5; *Glyphidodon lacrymatus*, fig. 6; *Amblypomacentrus breviceps*, fig. 7; *Pomacentrus littoralis*, K. v. H., fig. 8; *Chromis analis*, Blkr., pl. cccv. fig. 1; *Pomacentrus rhodonotus*, fig. 2; *Paraglyphidodon xanthurus*, fig. 3; *Glyphidodon aureus*, K. v. H., fig. 4; *Chromis xanthurus*, fig. 5; *Glyphidodontops albo-fasciatus*, fig. 6; *Paraglyphidodon behni*, fig. 7; *Pomacentrus trilineatus*, pl. vi. figs. 1-6, *amboinensis*, fig. 7, *dimidiatus*, fig. 8; *Dischistodus chryso-pæcilus*, fig. 9; *Chromis cinerascens*, pl. cccvii. fig. 1; *Glyphidodon leucozona*, fig. 2, *Glyphidodontops zonatus*, fig. 3; *Glyphidodon bengalensis*, C. V., fig. 4, *leucogaster*, fig. 5; *Glyphidodontops unimaculatus*, fig. 6; *Paraglyphidodon melanopus*, fig. 7; *Dischistodus prosopotaenia*, fig. 8; *Parapomacentrus polynema*, pl. cccviii. fig. 1; *Pomacentrus tenuis*, fig. 2, *cyanomus*, fig. 3, *melanochir*, fig. 4; *Glyphidodon celestinus*, C. V., fig. 5; *Pomacentrus violascens*, fig. 6, *anabatoïdes*, fig. 7; *Parapomacentrus bankieri*, fig. 8; *Pomacentrus pavo*, Lac., fig. 9; *Tetradrachmum melanurus*, pl. cccix. fig. 1; *Glyphidodontops cyaneus*, fig. 2; *Tetradrachmum reticulatum*, fig. 3, *arcuatum*, Cant., fig. 6, *trimaculatum*, fig. 8; *Paraglyphidodon oxycephalus*, fig. 4; *Glyphidodon septem-fasciatus*, C. V., fig. 5, *dicki*, Lién., fig. 7; *Pomacentrus asyrron*, pl. cccx. fig. 1; *Glyphidodontops antierius*, fig. 2; *Glyphidodon trifasciatus*, fig. 3, *plagiometopon*, fig. 4, *sordidus*, Rüpp., fig. 5; *Glyphidodontops uni-ocellatus*, fig. 6; *Acanthochromis polyacanthus*, Gill, fig. 7; and 8 species of (*Amphiprion*) *Prochilus*, pl. cccc.

(*Amphiprion*) *Prochilus polylepis*, p. 135, *macrostoma*, p. 136, spp. nn., Bleeker, Versl. Ak. Amst. (2) xi. New Guinea and Amboina.

Amphiprion tricolor, Gthr., = *frenatus*, Brev., and ? = *ephippium*, Bl., var., p. 378, pl. lxx. fig. 2; *A. xanthurus*, C. V., = *bicinctus*, Rüpp., = *clarki*, Benn., p. 378, and others noticed and figured by Day, *op. cit.*

Tetradrachmum, Cantor, adopted for *Dascyllus*. *T. marginatum*, Rp., = *xanthozona*, Blkr., p. 381, pl. lxxix. fig. 7; *T. aruanus*, Bl., figured, pl. lxxx. fig. 6. *Id. op. cit.*

Pomacentrus punctatus, Q. G., = *trilineatus*, Ehrb.; C. V. Kossmann & Räuber, l. c. p. 23.

Pomacentrus obscurus, sp. n., Alleyne & Macleay, l. c. p. 343, pl. xv. fig. 2.

Glyphidodon fasciatus, Gthr., = *unimaculatus*, C. V., = *antierius*, C. V., p. 387; *G. adenensis*, Gthr., = *sordidus*, Forsk., p. 385; figures of *G. notatus*, Day, pl. lxxxiii. fig. 5; *septem-fasciatus*, C. V., pl. lxxxi. fig. 7; *leucogaster*, Blkr., pl. lxxxi. fig. 3; *sindensis*, Day, pl. lxxxii. fig. 2. *G. leucopleura*, sp. n., Andamans, p. 385, pl. lxxxiii. fig. 4. Day, *op. cit.*

Heliaestes lepidurus, C. V., figured; *id. op. cit.* pl. lxxxii. fig. 1.

Heptadecacanthus, g. n. Type, *H. longicaudis*, sp. n., Alleyne & Macleay, l. c. p. 343, pl. xv. fig. 3, Cape Grenville.

LABRIDÆ.

Charops notatus, sp. n., Alleyne & Macleay, *l. c.* p. 343, pl. xvi. fig. 1, Cape Grenville.

Cheilolabrus, g. n., type, *C. magnilabris*, sp. n., *id. l. c.* pl. xvi. fig. 2, Darnley Island.

Labrichthys cincta, sp. n., Hutton, Tr. N. Z. Inst. ix. p. 354, New Zealand.

Cosyphus neilli, Day, = *axillaris* var.; Day, *l. c.* p. 392.

Epibulus striatus, Day, figured, pl. lxxxvii. fig. 2, *id. l. c.*

Anampses diadematus, Rüpp., = *cæruleo-punctatus*, Rüpp.; *id. l. c.* p. 395.

Labrichthys bicolor, Day, = *Hemigymnus melapterus*, Bl.; *Halichares seefasciatus*, Rüpp., = *H. fasciatus*. *Id. l. c.* p. 396.

Stethojulis strigiventer, Benn., figured, pl. lxxxiv. fig. 7, and notice of *Julis finlaysoni*, C. V., which may be of this genus, p. 397; *id. l. c.*

PlatyGLOSSUS pagenstecheri, sp. n., Kossmann & Räuber, *l. c.* p. 25, pl. i. fig. 5.

PlatyGLOSSUS bifasciatus, Steind., = *hyrtlui*, Blkr.; Day, *l. c.* p. 398.

Novacula rufa, Day, figured, pl. lxxv. fig. 6; *Xyrichthys cyanifrons*, Jerd., = *N. punctulata*, figured, pl. lxxviii. fig. 2. *Id. l. c.*

Julis guentheri, Blkr., = *trilobatus*, C. V., = *umbrostigma*, Rüpp., = *purpurea*, Frsk.; *id. l. c.* p. 404.

Gomphosus melanotus, Blkr., = *pectoralis*, Q. G.; *id. l. c.* p. 406.

^ *Julis nitidissima*, sp. n., Goode, Am. J. Sci. (3) xiv. p. 293, Bermudas.

Coris formosa, Blkr., = *formosus*, Benn., = *pulcherrima*, Gthr.; *C. cingulum*, Lacép., = *agula*, Lacép. Day, *l. c.* p. 408.

Pseudoscarus augustinus and *ismailius*, spp. nn., Kossmann & Räuber, *l. c.* p. 27, Red Sea.

Pseudoscarus maculosus, Gthr., = *ghobbam*, Klunz. (nec Gthr.), = *pyrrhostethus*, Blkr., = *ghobbam*, Frsk. (nec Rüpp.), p. 412; *russelli*, C. V., = *rivulatus*, C. V.; *troschelli*, Blkr., = *sordidus*, Frsk., p. 413. Day, *l. c.*

Pseudoscarus flavo-lineatus, pl. xvi. fig. 3, *nudirostris*, pl. xvii. fig. 1, Alleyne & Macleay, *l. c.* p. 346, Cape Grenville, spp. nn.

CHROMIDÆ.

Eetroplus canarensis, sp. n., Day, *op. cit.* p. 414, pl. lxxxix. fig. 5, S. Canara.

Neetroplus nicaraguensis, sp. n., Gill & Bransford, P. Ac. Philad. 1877, p. 186, Lake Nicaragua.

Coptodon zilli, Gerv., = *Chromis tristrami*, Gthr.; *Sparus desfontainii* is a distinct but allied species. E. Sauvage, Bull. Soc. Philom. (7) i. pp. 160-165.

Heros rostratus, p. 181, *basilaris*, p. 182, *balteatus*, p. 184, *centrarchus*, p. 185, spp. nn., Gill & Bransford, *l. c.* Lake Nicaragua.

ANACANTHINI.

LYCODIDÆ.

- ✓ *Lycodes verrilli*, sp. n., G. B. Goode & T. H. Bean, Am. J. Sci. (3) xiv. p. 474, off Cape Negro and Halifax, Nova Scotia.

GADIDÆ.

Bregmaceros punctatum, Gthr., = *Asthenurus atripinnis*, Tickell, figured, pl. xci. fig. 1; remarks on the distinctness of *B. maclellandi*, Thoms., p. 417. Day, *op. cit.*

OPHIDIIDÆ.

- Brotula maculata*, Day, figured; Day, *op. cit.* pl. xci. fig. 2.
Siremo grandis, sp. n., Günther, Ann. N. H. (4) xx. p. 437, Japan.
Dinematicthys consobrinus, Hutton; the type has two minute spinæ in front of dorsal; ♀ belongs to *Gadopsidæ*. Hector, Ann. N. H. (4) xix. p. 341; figured, Tr. N. Z. Inst. pl. ix. fig. 77 A.
Ammodytes callolepis, Gthr., figured by Day, *op. cit.* pl. xci. fig. 3.

MACRURIDÆ.

- ✓ *Macrurus bairdi*, sp. n., Goode & Bean, l. c. p. 471, Gulf of Maine. The suborbital ridge is not joined to the præ-opercular angle.
Macrurus macrochir and *parallelus*, spp. nn., Günther, Ann. N. H. (4) xx. pp. 438 & 439, Japan.
Coryphænoides longifilis, *altipinnis*, p. 439, *nasutus*, *asper*, p. 440, *leptolepis*, *villosus*, p. 441, spp. nn., *id.* l. c. Japan.

PLEURONECTIDÆ.

- AGASSIZ, A. On the Development of Pleuronectoids. Am. Nat. x. p. 705, and J. Zool. vi. pp. 193-197.
Citharichthys aureus, sp. n., Day, *op. cit.* p. 422, pl. xc. fig. 3, Madras.
Pseudorhombus russelli, Gray, = *orsius*, Blkr., p. 423, *javanicus*, Blkr., figured, pl. xcii. fig. 2; *tri-ocellatus*, Bl. Schn., figured, pl. xcii. fig. 1. Day, *op. cit.*
Pleuronectes yokohamæ, sp. n., Günther, Ann. N. H. (4) xx. p. 442, Japan.
Solea elongata, sp. n., Madras, p. 425, pl. xc. fig. 4; *ovata*, Rich., figured, pl. xciii. fig. 1. Day, *op. cit.*
 ✓ *Achirus lorentzi*, sp. n., H. Weyenbergh, Nuevos Pescados, &c., p. 13, pl. i. fig. 1, Santa Fé, Uruguay.
Synaptura orientalis, Bl. Schn., = *foliacea*, Rich., = *cinerascens*, Gthr., = *Brachirus sundaicus*, Blkr., p. 429, figured, pl. xciii. fig. 4, & xcv. fig. 2; *cornuta*, C. V., figured, pl. exiv. fig. 4: Day, *op. cit.* *S. melanorrhyncha*, Blkr., figured; Martens, l. c. pl. xiv. figs. 2 & 3.
Cynoglossus quinquelineatus, p. 432, pl. xcvi. fig. 1, Madras, *sindensis*

p. 434, pl. xc. fig. 6, *dispar*, p. 434, pl. xcvi. fig. 2, Bombay, *semifasciatus*, p. 436, pl. xcvi. fig. 5, Madras, *brevirostris*, p. 437, pl. xcvi. fig. 6, Madras; Day, *op. cit.*, spp. nn.

Cynoglossus arel, Bl. Schn., pl. xcvi. fig. 2, *dubius*, Day, pl. xcv. fig. 2, *bengalensis*, Blkr., pl. xcvi. fig. 4, *buchanani*, Day, = *hamiltoni*, Gthr., = *Achirus cynoglossus*, H. B., pl. xcv. fig. 3; figured, *id. l. c.*

PHYSOSTOMI.

SILURIDÆ.

JORDAN, D. S. Synopsis of Freshwater *Siluridæ* of United States; analyses of genera and species. Bull. Nat. Mus. x. pp. 69-103, pls. i.-xliv.

Clarias melanoderma, Blkr., = *dussumieri*, C. V., p. 484; *C. assamensis*, sp. n., p. 485, Assam. Day, *op. cit.*

Chaca lophioides, C. V., = *buchanani*, Gthr., = *Platystacus chaca*, H. B.; *id. op. cit.* p. 481, pl. cxii. fig. 2. *Chaca bankanensis*, Blkr., figured, Martens, *l. c.* p. 302, pl. viii.

Saccobranchus singio, H. B., = *microcephalus*, Gthr., = *fossilis*, Bl.; Day, *op. cit.* p. 466, pl. cxiv. fig. 1.

Silurus winadensis, Day, = *punctatus*, Day, p. 480, pl. cxi. fig. 6, *dukai*, Day, = *afghana*, Gthr., p. 481, pl. cxii. fig. 1, *cochinchinensis*, C. V., figured, pl. cxiii. fig. 2; *id. op. cit.*

Callichrous sindensis, sp. n., p. 476, pl. cx. fig. 1, Sind; figures of *C. bimaculatus*, Bl., = *cheera*, H. B., pl. cx. figs. 4 & 5; *nigrescens*, Day, = *pabo*, H. B., pl. cx. fig. 6; *notatus*, Day, = *macrophthalmus*, Blyth, pl. cx. figs. 2 & 3; *malabaricus*, C. V., pl. cxi. fig. 1. *Id. op. cit.*

Callichrous egertoni, Day, = *Cryptopterus lato-vittatus*, Playf., = *Silurichthys lamghur*, Gthr., = *anastomus*, C. V., = *pabda*, H. B.; *id. op. cit.* p. 479, pl. cxi. figs. 2 & 3.

Ailia affinis, Gthr., = *bengalensis*, Gray, = *coila*, H. B.; *id. op. cit.* p. 488, pl. cxiv. fig. 4.

Pseudeutropius longimanus, Gthr., = *taakree*, Sykes, p. 471, pl. cix. fig. 4; *acutirostris*, Day, figured, pl. cix. fig. 1; *murius*, H. B., pl. cix. fig. 6; *mittchelli*, Gthr., = *sykesi*, Jerd., p. 473, pl. cix. fig. 5. *Id. op. cit.*

Silundia sykesi, Day, figured, *id. op. cit.* pl. cxiv. fig. 2.

Macrones affinis, Blyth, not being *affinis*, Jerd., renamed *blythi*, p. 445; figures of *M. seenghala*, Sykes (*lamarrii*, C. V.), pl. xcix. fig. 1, *punctatus*, Jerd., pl. c. fig. 3, *tengara*, H. B., pl. ci. fig. 5, *oculatus*, C. V., pl. xcvi. fig. 4, *leucophasis*, Blyth, pl. c. fig. 2, *montanus*, Jerd., pl. ci. fig. 4, *keletius*, C. V., pl. xcvi. fig. 3, *malabaricus*, Day, pl. ci. fig. 2, *armatus*, Day, pl. ci. fig. 3, *keletius*, Blkr. & Gthr. (*nec* C. V., *nec* Jerd.), renamed *bleekeri*, pl. ci. fig. 1; *M. microphthalmus*, sp. n., p. 446, pl. c. fig. 4, Burma. Day, *op. cit.*

Bagroides melanopterus, Bleeker, figured; Martens, *l. c.* p. 302, pl. ix.

Rita sykesi, Day, = *pavimentata*, Val., p. 455, pl. ciii. fig. 3; *R. chrysea*, sp. n., p. 455, pl. civ. fig. 1, Orissa. Day, *op. cit.*

Olyra burmanica, sp. n., *id. op. cit.* p. 475, pl. cxi. fig. 5, Pegue Yomas.
Ichthaelurus robustus, sp. n., Jordan, Bull. Nat. Mus. x. p. 76, figs. 3 & 4, Ohio.

Aniurus erebennus, p. 85, figs. 19 & 20, Florida, *brunneus*, p. 93, figs. 48 & 49, Georgia; *id. l. c.* & Ann. Lyc. N. York, xi. p. 366, spp. nn.

Noturus exilis, Nelson, Bull. Ill. Mus. 1876, p. 51, figured, figs. 58 & 59; *miurus*, p. 100, figs. 60 & 61; *eleutherus*, p. 101, figs. 62 & 63, Tennessee and N. Carolina; *leptacanthus*, p. 102, figs. 64 & 65, Georgia; *sialis* (= *flavus*), p. 102, figs. 68 & 69, Mississippi, Lakes, and Red River. Jordan, Bull. Nat. Mus. x., spp. nn.

Noturus leptacanthus, p. 352, *eleutherus*, p. 370, described; *id.* Ann. Lyc. N. York, xi., Georgia, spp. nn.

Platystoma luceri, sp. n., H. Weyenbergh, Nuevos Pescados, &c., p. 10, pl. iii. figs. 1-3, Santa Fé.

Arius. Figures and synonymy of *A. burmanicus*, Day, p. 458, pl. cv. fig. 4, *arioides*, C. V., = *nenga*, H. B., pl. civ. fig. 3, *sumatranus*, Benn., pl. cvii. fig. 6, *parvipinnis*, Day (? *chinta*, C. V. & Blkr.), pl. cxiii. fig. 1, *subrostratus*, C. V., pl. cvi. fig. 6, *sona*, H. B., pl. cv. fig. 2, *andamanensis*, Day, = *thalassinus*, Rüpp., pl. civ. fig. 4, & cv. fig. 1, *buchanani*, Day (*Pimelodus arius*, H. B.), pl. cv. fig. 6, *macracanthus*, Gthr., = *gagora*, H. B., pl. cvii. fig. 2, *jutius*, H. B., pl. cvi. fig. 4, *tenuispinis*, Day (? *layardi*, Gthr.), pl. cvii. fig. 5, *boakii*, Turner, = *falcarius*, Rich., p. 463, pl. cvi. fig. 5; Day, *op. cit.*

Arius acutirostris, p. 469, pl. cvii. fig. 1, Burma, *serratus*, p. 462, pl. xcv. fig. 3, *malabaricus*, p. 464, pl. cvii. fig. 4, Canara, *platystomus*, p. 464, pl. cvii. fig. 3, Canara; *id. l. c.* spp. nn.

Aillichthys punctata, Day, figured; *id. op. cit.* pl. cxiv. fig. 5.

Osteogeniosus sthenocephalus, sp. n., *id. op. cit.* p. 469, pl. cviii. fig. 3, Moulmein.

Glyptosternum ionah, Sykes, pl. cxiii. fig. 5; *trilineatum*, Blyth, pl. cxvi. fig. 3; *botia*, H. B., pl. cxiii. fig. 4; *telchitta*, H. B., pl. cxvi. fig. 2; *madraspatanum*, pl. cxvi. fig. 4, figured; *G. modestum*, Day, = *stoliczka*, Steind., = *pectinopterum*, McClell., p. 499, pl. cxvi. fig. 6; *id. op. cit.*

Euglyptosternum lineatum, sp. n., *id. op. cit.* p. 500, pl. cxvi. fig. 7, Jumna.

Amblyceps tenuispinis, Blyth, = *cæcutiens*, Blyth, = *mangois*, H. B., = *Akysis kurzi*, Day; *id. op. cit.* p. 490, pls. cii. fig. 6, & cxvii. fig. 1.

Doras albo-maculatus, sp. n., Peters, l. c. p. 470, Calabozo.

Malapterurus electricus. See *Mormyridæ*, infra, p. 25 (Baluchin).

Plecostomus luetkeni, p. 217 (= *Plima*, Steind., nec Ltk.), and *P. vailanti*, p. 225, Steindachner, l. c., Brazil: spp. nn.

Chaetostomus nigro-lineatus, sp. n., Peters, l. c. p. 471, pl. fig. 3, Calabozo.

Rhinelepis parahybæ, p. 218, and *agassizi*, p. 228, Steindachner, l. c., Brazil: spp. nn.

Sisor rhabdophorus, H. B., figured; Day, *op. cit.* pl. cxv. figs. 1 A, B.

Otocinclus affinis and *maculicauda*, spp. nn., Steindachner, l. c. pp. 221 & 222, S.E. Brazil.

Nangra, g. n. Br. 5 or 6. Gill-openings rather wide, and not, or only slightly, adherent to skin of isthmus. Thorax smooth. Upper surface

of head with sharp longitudinal ridges, and covered by thin skin. Eyes subcutaneous. Snout overhanging the mouth, which is transverse. Nostrils close together, the anterior rounded, the posterior with a barbel. Barbels 8 (one nasal, which may be rudimentary); one maxillary and two mandibular pairs, the inner of which last are anterior to the external pair. Villiform teeth in jaws, palate edentulous. First dorsal fin with one spine and six to eight rays; adipose, of moderate length. A pectoral spine. Ventral with six rays, situated posterior to the dorsal. Anal, 10-12. Caudal forked. Air-vessel in two rounded portions, each of which is enclosed in bone. *N. punctata*, sp. n., Day, *op. cit.* p. 494, pl. cxv. fig. 8, Bengal. Other species included in the genus, *Pimelodus nangra*, H. B. (renamed *N. buchanani*), and *P. viridescens*, H. B.

Erethistes (Hara) *buchanani*, Blyth, = *pusillus*, M. & Tr., = *hara*, H. B., p. 452, pl. cii. figs. 1 & 2; *conta*, H. B., pl. cii. fig. 5; *jerdoni*, Day, pl. cii. fig. 3; *elongata*, Day, pl. cii. fig. 4, figured: Day, *op. cit.*

Ecostoma blythi, Day, pl. cxvii. fig. 2; *stoliczkae*, Day, pl. cxvii. fig. 3, figured: *id. op. cit.*

Trichomycterus corduvensis and *tenuis*, spp. nn., H. Weyenbergh, *op. cit.* pp. 11 & 12, pl. iii. figs. 1 & 2, & A-C, Cordoba.

Trichomycterus poeyanus, sp. n. (*rivulatus*, Cope, *olim*), p. 47, Peru, T. *pardus*, Cope, compared with other species; Cope, P. Am. Phil. Soc. xvii. p. 45.

CHARACINIDÆ.

Bramocharax, g. n. Body elongated, compressed fusiform, and with belly rounded in front of ventrals. Scales entire, striated; lateral line moderately decurved and complete. Snout pointed, profile slightly incurved; buccal and combined post-ocular bones subequal and enlarged; nostrils close together; mouth cleft to anterior border of eye; teeth uni-serial in jaws, compressed and conical on intermaxillary and dentary, those of the latter enlarged especially on each side of the symphysis; on supra-maxillary entire edge, small, compressed; multicuspid; branchial apertures ample, membranes deeply cleft and free from isthmus. Dorsal short, submedian, between ventrals and anal, which is moderately long. Type, *B. bransfordi*, sp. n., Gill, P. Ac. Philad. 1877, p. 189, Nicaragua.

Prochilodus nigricans, Müll., noticed; H. Weyenbergh, Nuevos Pescados, p. 5.

Tetragonopterus ipanguianus, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 44, Peru.

[*Anacyrtus*] *Hydrocyon argenteum*, Val., and [*Salminus*] *brevidens*, Cuv., noticed by H. Weyenbergh, Nuevos Pescados, &c., pp. 4 & 5.

Serrasalmo irritans, sp. n., Peters, l. c. p. 472, Fernando de Apure.

SCOPELIDÆ.

Saurus indicus, Day, figured; Day, *op. cit.* pl. cxvii. fig. 4.

Scopelus indicus, sp. n., *id. op. cit.* p. 507, pl. cxviii. fig. 2, Vizagapatam.

Aulopus japonicus, sp. n., Günther, Ann. N. H. (4) xx. p. 444, Japan.

SALMONIDÆ.

Remarks on the spawning of Salmon, and F. Buckland's statement that it is triennial and not annual; Nature, xv. p. 375.

✓ *Salmo alipes*, Rich., and *S. naresi*, sp. n., Günther, P. Z. S. 1877, p. 476, pl. 1., Lakes in Discovery Bay.

Salmo macrostoma, sp. n., *id.* Ann. N. H. (4) xx. p. 444, Japan.

✓ *Salmo arcturus*, sp. n., *id.* P. Z. S. 1877, p. 294, pl. xxxii. The most northern Salmonoid known, resembles the Killin Charr, but is more slender; N. lat. 82° 28'–34'.

Coregonus oxyrrhynchus added to the British fauna; its occurrence in Lincolnshire. F. Day, P. Z. S. 1877, p. 419, fig. of head.

Salmo caspius, p. 62, fig. 15; *ischchan* (Pall.), p. 65, fig. 16; *gegarkuni* (Pall.), p. 68, fig. 17; Kessler, *op. cit.*, Aralo-Caspio-Pontine region; *S. bodschac*, Lake Gokcha: spp. nn.

MORMYRIDÆ.

BALUCHIN, —. Beobachtungen und Versuche am Zitterwelse und Mormyrus des Niles. Arch. Anat. Phys. (Phys. Abth.) 1877, pp. 250–273, pl. vi.

ESOCIDÆ.

Esox nobilior, Thomps., described; it is not clear why Mitchell's name *E. masquinongy* should be set aside; Jordan, Bull. Nat. Mus. x. p. 54.

SCOMBRESOCIDÆ.

✓ *Belone jonesi*, sp. n., Goode, Am. J. Sci. (3) xiv. p. 295, Bermudas.

Belone choram, Frsk., pl. cxviii. fig. 4; *cancila*, H. B., fig. 5; *caudimaculata*, C. V., = *strongylurus*, V. H., pl. cxviii. fig. 6: figured, Day, *op. cit.*

Hemirhamphus georgii, Blkr., = *cantori*, Blkr., p. 514, pl. cxix. fig. 1 *xanthopterus*, C. V., fig. 2; *dussumieri*, Blkr., = *reynaldi*, C. V., p. 515; *plumatus*, Blyth, = *marginatus*, Blkr., = *georgii*, C. V., p. 515, pl. cxx. fig. 2; *commersoni*, C. V., = *far*, Rüpp., p. 516, pl. cxx. fig. 3; *brachynopterus*, Blyth, = *limbatus*, C. V., p. 516, pl. cxix. fig. 3; *cirratus*, Day, = *striga*, Blyth, = *buffoni*, C. V., p. 516, pl. cxix. fig. 4; *neglectus*, Day, = *amblyurus*, Blkr., = *ectunctio*, H. B., p. 517, pl. cxix. fig. 6; synonymy and figures: Day, *op. cit.*

Exocoetus cirriger, sp. n., Peters, l. c. p. 555, fig. 1, China.

[N.B.—The notice of C. Lütken's important paper on *Exocoetus* in Vid. Medd. 1876, pp. 389–408, was placed in Zool. Rec. xiii. Pisces, p. 35, by an accidental transposition of slips, under *Stomiidæ*.]

UMBRIDÆ.

Fundulus fuscus, Ayres (*Umbra pygmaea*, De Kay), proves to be quite different from *U. limi*, with which it was confounded, and is called *U. pygmaea*; Jordan, Bull. Nat. Mus. x. p. 53.

CYPRINODONTIDÆ.

Cyprinodon stoliczkanus, Day, = *dispar*, Rüpp.; Day, *op. cit.* p. 521, pl. cxxi. figs. 1 & 2.

Haplochilus argenteus, Day, = *cyanophthalmus*, Blyth, = *melastigma*, McClell., p. 522, pl. cxxi. fig. 4; *rubro-stigma*, Jord., pl. cxxi. fig. 5; *lineatus*, C. V., pl. cxxi. fig. 6; *panchax*, H. B., pl. cxxi. fig. 3; synonymy and figures: Day, *op. cit.*

Fundulus menona, Jordan & Copeland, P. Ac. Philad. 1877, p. 68, Wisconsin; *F. rhizophoræ*, Goode, Am. J. Sci. (3) xiv. p. 298, Bermudas: spp. nn.

Xenisma, g. n. for *Hydrargyra catenata*, Ag., and *X. stellifera*, sp. n., Jordan, Ann. Lyc. N. York, xi. p. 322, Upper Georgia.

Xiphophorus heckeli, p. 17, *obscurus*, p. 18, *minor*, p. 20, *mercedarius*, p. 22; figured, pl. iv.; H. Weyenbergh, l. c. La Plata: spp. nn.

CYPRINIDÆ.

FATIO, V. Sur la détermination des Cyprinoïdes. Verh. Ges. Bas. 1877, pp. 297-302.

Key to genera of American *Cyprinidæ*; Jordan, Bull. Nat. Mus. x. pp. 55-60.

Comparison of genera of *Catostomidæ*; Jordan & Brayton, P. Ac. Philad. 1877, pp. 282 & 283.

Lagochila, g. n. Similar to *Myxostoma* (*Ptychostomus*, Agass.), except in the structure of the mouth parts. Dorsal fin short. Mouth singular; the upper lip not protractile, greatly enlarged; lower lip developed as two separate lobes; lower jaw provided with a sheath. Air-bladder in three parts; scales large, subequal; pharyngeal bones and teeth ordinary; fontanelle well developed; lateral line well developed. *L. lacera*, sp. n., *ibid.* l. c. pp. 280-282, figs. 1 & 2, Georgia.

Catostomus nigricans, var. n. *etowanus*, Jordan, Ann. Lyc. N. York, xi. p. 345, Upper Georgia.

Myxostoma pæcilura, id. Bull. Nat. Mus. x. p. 66, Louisiana; *M. euryops*, id. Ann. Lyc. N. York, xi. p. 348, Upper Georgia: spp. nn.

Ichthyobus cyanellus, Nelson, Bull. Ills. Mus. Nat. Hist. 1876, p. 49, and *ischyrus*, id. P. Ac. Philad. 1877, p. 73, Illinois: spp. nn.

Bubalichthys altus, sp. n., id. P. Ac. Philad. p. 73, Illinois: other species noticed by Jordan, *ibid.*

Cirrina kuhli, Day (nec C. V.), renamed *Dangila burmanica*, Day, *op. cit.* p. 546, pl. cxxxi. fig. 2.

Cirrina, synonymy and figures of 5 species; id. *op. cit.* pp. 547-549.

Osteochilus chalybeatus, C. V., pl. cxxix. fig. 1, *neilli*, Day, pl. cxxx. fig. 2, figured; Day, *op. cit.* *O. vittatus*, C. V., figured; Martens, l. c. pl. ii. fig. 3.

Labeo nigripinnis, sp. n., Sind, p. 544, pl. cxxxii. fig. 3; figures and synonymy of 23 other species: Day, *op. cit.* pp. 535-545.

Discognathus jerdoni, Day, = *Gonorrhynchus gotyla*, Jerd., p. 528, pl. cxxii. fig. 6; *D. modestus*, Day, figured, pl. cxxii. fig. 5: Day, *op. cit.*

Capoeta buhsi, p. 85, *hohenackeri*, p. 189, spp. nn.; *C. sevangi*, De Fil., p. 81, figured, fig. 18: Kessler, *op. cit.*

Scaphiodon watsoni, Day, pl. cxxxv. fig. 2, *irregularis*, Day, pl. cxxxv. fig. 3, *nashi*, Day, pl. cxxxiii. fig. 3, *brevadorsalis*, Day, pl. cxxxiii. fig. 2, figured. *S. thomassi*, sp. n., South Canara, p. 551, pl. cxxxiv. fig. 1: Day, *op. cit.*

Barbus trevelyani, sp. n., Günther, Ann. N. H. (4) xix. p. 313, Caffraria. *Barbus sumatranus*, Blkr., and *schwanefeldi*, Blkr., pl. ii., *B. fasciatus*, Blkr., pl. xii. fig. 2, figured by Martens, *l. c.*

Barbus tauricus, p. 93, *petenyi* (var. ?), p. 96, *circuasicus*, p. 98, *caucasicus*, p. 102, *gotschaicus*, p. 105, fig. 19, *mursoides*, p. 120; Kessler, *op. cit.*, Aralo-Caspio-Pontine region: spp. nn.

Orinus maculatus, Gthr. (nec McClell.), = *richardsoni*, Gray, p. 530, pl. cxxv. fig. 4; *micracanthus*, Gthr., = *plagiostomus*, Heck., p. 530: Day, *op. cit.*

Schizopygopsis stoliczkae, Steind., figured; *id. op. cit.* pl. cxxiv. fig. 2. *Schizothorax hodgsoni*, Gthr., = *progastus*, McClell.; list of 18 other species, some of which are figured: *id. op. cit.* p. 532.

Nocomis hyalinus, Cope. Rafinesque's name *amblops* adopted, and varieties characterized, p. 328; *N. rubrifrons*, sp. n., p. 330, Ocmulgee river, Georgia: Jordan, Ann. Lyc. N. York, xi. *N. milneri*, sp. n., *id. Bull. Nat. Mus.* x. p. 64, Lake Superior.

Luciosoma trinema, Blkr., figured by Martens, *op. cit.* pl. xii. fig. 1.

Phenacobius catostomus, sp. n., Jordan, Ann. Lyc. N. York, xi. p. 332, Upper Georgia.

Semiplotus modestus, Day, figured; Day, *op. cit.* pl. cxxxiii. fig. 1.

Hybopsis chrosomus, p. 333, *xenocephalus*, p. 334, Jordan, *l. c.*, Upper Georgia: spp. nn.

Leuciscus hakuensis, sp. n., Günther, Ann. N. H. (4) xx. p. 442, Japan.

Squalius oxianus, p. 124, *danilevskii*, p. 126, Kessler, *op. cit.*: spp. nn.

Idus oxianus, sp. n., *id. ibid.*

Photogenis: on the genus, p. 335; *P. stigmaturus*, *callistius*, and *cæruleus*, Upper Georgia, pp. 335-339; *eurystomus*, p. 356, Chatahoochee river: Jordan, Ann. Lyc. N. York, xi.: spp. nn.

Photogenis ariommus, Cope, is a true *Cliola*, p. 64; *P. grandipinnis*, sp. n., p. 62, Georgia: *id. Bull. Nat. Mus.* x.

Episema, g. n., for 4 species separated from *Photogenis*; *id. P. Ac. Philad.* 1877, p. 78. *E. callisema*, sp. n., *id. Ann. Lyc. N. York*, xi. p. 363, Upper Georgia.

Luxilus selene, p. 69, Wisconsin, *roseus*, p. 61, Louisiana; *id. Bull. Nat. Mus.* x.: spp. nn.

Lythrurus cyanocephalus, sp. n., *id. P. Ac. Philad.* 1877, p. 70, Wisconsin. *Cyprinella calliura*, sp. n., *id. Bull. Nat. Mus.* x. p. 61, Alabama and Louisiana.

Semotilus thoreauianus, sp. n., *id. l. c.* p. 63, Georgia.

Minnilus (or *Photogenis*) *xenurus*, sp. n., *id. P. Ac. Philad.* 1877, p. 79, and Ann. Lyc. N. York, xi. p. 364, Georgia.

Nototropus lirus, p. 342, *stilbius*, p. 365, *id. Ann. Lyc. N. York*, xi., Upper Georgia: spp. nn.

- Chondrostoma oxyr[r]hynchum*, p. 134, fig. 20, *cyri*, p. 137, fig. 21; Kessler, *op. cit.*: spp. nn.
Notemigonus ischanus, sp. n., Jordan, *l. c.* p. 364, Upper Georgia.
Aspius erythrostomus, sp. n., Kessler, *op. cit.* p. 143.
Alburnus filippii, p. 153, *hohenackeri*, p. 156, *punctulatus*, p. 159, fig. 22; *id. l. c.*: spp. nn.
Acanthobrama bogdanovi, sp. n., *id. l. c.* p. 166.
Homaloptera bilineata, Blyth, = *Nemachilus serpentarius*, Day, ? = *sucatio*, H. B.; Day, *op. cit.* p. 526, pl. cxxi. fig. 8.
Homaloptera (Otonema) rotundicauda, Mart., figured by Martens, *op. cit.* p. 403, pl. x. figs. 1 & 2.
Nemachilus brandti, sp. n., Kessler, *op. cit.* p. 174, fig. 23.
Cobitis hohenackeri, p. 177, *aratensis*?, p. 184, *id. l. c.*: spp. nn.

CLUPEIDÆ.

On Races of Herrings observed in the Sound; G. Winther, Nord. Tidssk. Fisk. 1876.

Engraulis. On the hitherto undescribed decussation of the optic nerve; Solger, Ber. Ges. Halle, 1877, p. 9.

Engraulis tapirulus, sp. n., Cope, P. Am. Phil. Soc. xvii. p. 45, Peru.

Clupeonella grimmeri, sp. n., Kessler, *op. cit.* p. 187.

Megalops. A species observed at Toro Rapids, Lake Nicaragua. Not hitherto known to occur in isolated bodies of fresh water so far from the sea. Bransford, P. Ac. Philad. 1877, p. 187.

BATHYTHRISIDÆ (Fam. Nov.).

Body oblong, with rounded abdomen, covered with cycloid scales; head naked; no barbels. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Opercular apparatus complete. No adipose fin; dorsal fin much elongate, many-rayed; anal fin short. Stomach with a blind sac; pyloric appendages numerous. Gill-apparatus well developed; pseudobranchiæ; gill-openings wide; an air-bladder. Ova very small; ovaries without duct.

Bathyrhissa, g. n. Body covered with scales of moderate size. Head narrow, oblong, with the muciferous channels much developed. Eye large. Mouth narrow, coregonoid, with bands of minute teeth embedded in the thick lips; maxillary with a marginal row of very small teeth. Caudal fin forked, with a dense layer of small scales. Air-bladder with very thick walls, terminating in two short horns in front, pointed behind.

Bathyrhissa dorsalis, sp. n., Günther, Ann. N. H. (4) xx. p. 443, Inosima, Japan.

OSTEOGLOSSIDÆ.

Osteoglossum formosum, Müll., figured by Martens, *l. c.* pl. xiii.

HYODONTIDÆ.

Hyodon selenops, sp. n., Jordan, Bull. Nat. Mus. x. p. 67, Tennessee and Alabama.

HALOSAURIDÆ.

Halosaurus affinis, sp. n., Günther, Ann. N. H. (4) xx. p. 444, Japan.

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FREUD, S. Beobachtungen über Gestaltung und 'feineren Bau der als Hoden beschriebenen Lappenorgane des Aals. SB. Ak. Wien, lxxv. pp. 419-430, pl. figs. 1-5.

An examination of 50 eels has shown that Dareste's theory of fruitful ('pimperneau') and sterile varieties [see Zool. Rec. xii. p. 126] is not tenable.

Observations on habits and food of eels; O. Melsheimer, Nature, xv. p. 324.

Murana krulli, sp. n., Hector, l. c. p. 468, pl. viii. New Zealand.

Sternarchus sacksi, sp. n., Peters, l. c. p. 473, pl. fig. 4, Fernando de Apure.

Gymnotus electricus. Carl Sachs, in "Beobachtungen und Versuche am südamerikanischen Zitteraale," Arch. Anat. Phys. 1877 (Physiol. Abth.) pp. 66-95, gives the results of an expedition undertaken for the purpose of studying the electro-motive organs with sufficient apparatus on the spot; the Gymnotes had left the locality in which they were found by Humboldt, and were studied in a river near Calabozo.

Synbranchus hieronymi, *doringi*, *tigrinus*, spp. nn., Weyenbergh, l. c. pp. 14-16, pls. i. & ii., La Plata.

Synphobranchus bathybius, North Pacific, and *S. affinis*, Japan, spp. nn., Günther, Ann. N. H. (4) xx. p. 445.

Congromuræna megastoma, sp. n., *id. ibid.*, Japan.

Netastoma parviceps, *id.* l. c. p. 446, Japan.

Anguilla brevirostris, sp. n., Cisternas, An. Soc. Esp. vi. p. 108, Valencia.

Ophichthys uniserialis, Cope, P. Am. Phil. Soc. xvii. p. 47, Peru; *O. biteniatus*, Peters, l. c. p. 556, fig. 2, Mombas: spp. nn.

LOPHOBRANCHII.

Ichthyocampus maculatus, sp. n., Alleyne & Macleay, l. c. p. 353, pl. xvii. fig. 2, Darnley Island. †

Syngnathus martensi, Peters, figured; Martens, l. c. pl. xiv. fig. 1.

PLECTOGNATHI.

Monacanthus cirrosus, sp. n., Kossmann & Räuber, l. c. p. 30, pl. ii. fig. 10, Red Sea.

Monacanthus modestus, sp. n., Günther, Ann. N. H. (4) xx. p. 446, Japan.

Balistes aculeatus, Linn., described as *Monacanthus cheverti*, sp. n., Alleyne & Macleay, l. c. p. 355, pl. xvii. fig. 3, & ii. p. 69.

Tetrodon palembangensis, Blkr., figured; Martens, l. c. pl. xiv. fig. 4.

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On the structure of *Amphioxus*. W. Rolph, SB. Ges. Leipzig, 1876, pp. 9-34, 50-53, 85-87. Schneider, Ber. Oberhess. Ges. Nov. 14, 1877, and Morph. JB. ii. pp. 87-164, pls. v.-vii. Langerhans, Arch. mikr. Anat. xii. pp. 290-342, pls. xii.-xv. Hoppe-Seyler is of opinion that *Amphioxus* does not properly belong to the *Vertebrata*; Arch. ges. Phys.

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BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

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* This paper is a portion of the volume of Transactions of the Royal Society not yet issued (1879); and is only left here as separate copies of it and of other portions of the Zoology of this Expedition appear to be in the hands of many Naturalists.—ED.

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- WEINKAUFF, H. C. Die Gattung *Oliva*. 'Parts (256) 261 & 262 of Küster's new edition of Chemnitz, pp. 65-120, pls. xvi.-xxxiii.
- . Die Gattung *Rissoina*. Op. cit. pts. 262 & 265, pp. 1-16.
- . Die Familie der *Cypræiden*. Op. cit. pt. 261, pp. 1-16.
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- . Sibiriens Land- och Sötvatten-Mollusker. Sv. Ak. Handl. (2) xiv. pt. 2, No. 12, 1876 (separate copy, 1877), 111 pp., 1 pl.
- YARROW, H. C. Report upon the collections of terrestrial and fluviatile *Mollusca*, made in portions of Colorado, Utah, New Mexico, and Arizona, during the years 1872, 1873, and 1874, in G. M. Wheeler's Report upon Geographical and Geological Surveys west of the 100th Meridian. V. Zoology (Washington: 1875, 4to), chapter xv. pp. 923-954.
- YATES, L. G. Notes on the aboriginal money of California. Am. Nat. xi. pp. 30-32, figs. 2 & 3.

Concerning the conchological journals:—vol. xxv. of the French "Journal de Conchyliologie," 418 pp., 13 pls.; vol. xxiv. of the German "Malakozoologische Blätter," 185 pp., 3 pls.; vol. iv. of the German "Jahrbuch der deutschen Malakozoologischen Gesellschaft," 368 pp., 12 pls., and "Nachrichtsblatt" of the same, 96 pp.; Nos. 10–13 of the English "Quarterly Journal of Conchology," pp. 101–288, 3 pls.; vol. iii. pts. 1–3 of the "Bullettino della Società Malacologica Italiana," 48 pp., 1 pl.; and vol. iv. of the Italian "Biblioteca Malacologica" (see Strobel), were published in 1877, and have been seen by the Recorder. Some older parts of the Italian "Bull. della Società mal. Ital.," and of its predecessor, the "Bull. malacologico Italiano," are included in this Record.

ANATOMY AND PHYSIOLOGY.

R. GARNER gives some general remarks on the structure of the *Mollusca*, and their place in the animal kingdom, maintaining the affinity with the *Brachiopoda* and *Tunicata*. Ann. N. H. (4) xix. pp. 356–380.

S. TRINCHESE, "Struttura del sistema nervoso dei Molluschi Gastropodi," Pisa: 1871, 8vo, 78 pp., 5 pls., treating chiefly on the microscopical structure of the ganglions and peripheral nerves of *Helix pomatia*; and L. STIEDA, "Notizie preliminari nell'intima struttura del sistema nervoso della *Sepia officinalis*," Rend. Acc. Nap. x. [Dec. 1871], may be mentioned here as omitted before.

H. v. IHERING has published a larger work on the nervous system and phylogeny of the *Mollusca* (title see above), the chief results of which, as to the classification, have been anticipated by his preliminary note of the preceding year [see Zool. Rec. xiii. *Moll.* pp. 14 & 15]. He insists on the fundamental differences between his *Platycochliides* [*Opisthobranchia* and *Pulmonata*, hermaphrodite Gastropods] and *Arthrocochliides* [*Prosobranchia*, unisexual Gastropods], the nervous system in the lowest forms of the latter very much resembling that of the *Turbellaria*, whereas in the lowest *Arthrocochliides* it has transversal commissures, which give the appearance of a ladder of ropes (Strickleiter).

The strict symmetrical arrangement of the single organs in pairs of equal size and structure is, according to the author, the lower or more original, and the asymmetrical arrangement prevailing on one side, rudimentary development on the one and translation from one to the other, the higher or more differentiated type in the *Mollusca*. He endeavours to point this out in the gills, nervous systems, &c.

C. SEMPER states that, in *Vaginulus*, and (somewhat modified) even in *Limax*, the ladder-like connection of the nervous trunk exists, contradictory to Ihering's classification; Arb. Inst. Würzb. iii. pp. 480–488. H. v. Ihering denies the value of this statement; SB. Soc. Erlang. ix. pp. 131–168.

H. v. IHERING has published further anatomical researches upon the nervous system of *Chiton*, *Fissurella*, *Scalaria*, *Turritella*, and *Vermetus*. The last two are very near each other, as are *Scalaria* and *Janthina* [which confirms the importance of the radula for classification]. Morph. JB. iii. pp. 155–178, pl. x.

C. SEMPER has found in some of the dorsal warts of *Onchidium* an optical apparatus, provided with cornea, lens, and a retina, in which three strata—one of strings or fibres, one of bacilli, and one of dark pigment—can be distinguished; the stratum of retinal fibres is the innermost, as in the eye of the *Vertebrata*, which is not the case in any *Evertebrata*, except *Hirudo* and *Pecten*, the eyes of which differ in other important points from those of *Onchidium*. An annulus ciliaris and a macula cœca are present. These eyes are supplied from the pallial nerves which come from the visceral ganglion of the pharyngeal ring; the eyes on the tentacles from the central ganglion. The author distinguishes the following modifications of these eyes:—

- i. The stratum of bacilli is regularly arranged like cylindrical epithelium; a number of eyes is crowded on the same tubercle of the back. *Onchidium verruculatum* and 8 other species.
- ii. The stratum of bacilli is irregularly arranged.
 - (a.) The eyes are isolated, each on a special contractile, not retractile, tubercle; cornea consisting of two strata, epidermis, and cutis, as in the preceding division. *O. coriaceum*, *luteum*, and *glabrum*; in the last, the lens consists of only five cells, in the two others, of many more.
 - (b.) The eyes are arranged in groups, either on the smooth skin of the back (*O. ambiguum*), or 3–4 on a tubercle (*O. typhæ*).

In 17 species, these eyes have been found; in 2 species examined by the author they are wanting. Reis. Philippin., iii. suppl. part, 45 pp., 5 pls. Preliminary note by the author himself, in Arch. mikr. Anat. xiv. pp. 118–124. Abstract by H. v. Ihering in JB. Anat. Physiol. vi. pp. 135–138.

IHERING's paper on the auditory organs of the *Mollusca* is also contained in SB. Soc. Erlang. ix. [1876–77] pp. 35–65.

A peculiar organ of sense [?] in the Bivalve genus *Yoldia* is described by W. K. BROOKS; it is a kind of tentacle, situated above the lower margin of the mantle, at the base of the siphon, only on the right side, composed of circular muscular fibres and a strong nerve within, coiled up at rest, extended and moving in all directions and even entering the siphonal tube. P. Am. Ass. xxiii. at Hartford, 1875, pp. 80–82, with woodcut.

J. KOLLMANN and W. FLEMMING discuss the vascular system of Mollusks, the same parts being declared by the former to be “lacunæ,” without proper walls, and filled with blood, and by the latter to be cells filled with slime. Ber. Vers. Naturf. Munich, 1877, p. 177.

C. POSNER (*l. c.*) supports Flemming's opinion as to the slime-cells, and is disposed not to admit the presence of true capillary vessels within the gills, but only lacunar holes.

In *Mytilus edulis*, A. SABATIER distinguishes true capillary vessels, provided with endothelium and lacunar capillaries without endothelium, the latter chiefly in the venous part of the vascular system. Ann. Sci. Nat. v. No. 1.

In the heart of *Pecten* and *Anodonta*, *Helix* and *Aplysia*, J. DOGIEL has found transversely striated muscular cells, and in the wall of the atrium, what he calls apolar ganglionic cells; Arch. mikr. Anat. xiv. pp. 59-65, 1 pl. FOSTER and DEW-SMITH, on the contrary, deny the presence of nerves and ganglia within the heart of Mollusks; tom. cit. pp. 317-321.

H. v. ILLERING distinguishes in the gills of bivalves two primary and two secondary plates—the former attached immediately to the trunk and without transverse connections, the latter to the free ventral edge of the former. The primary alone are to be found in the *Nuculidae* and *Solemya*; only one secondary, the inner, is to be seen in *Anatina* and *Lucina*; the outer secondary blade is much lengthened in *Cyrena* and many *Tellinidae*. Z. wiss. Zool. xxix. p. 610.

A. SABATIER describes the transverse connections between the longitudinal rays in the gills of *Mytilus edulis* as distinct hyaline bodies of high refraction, which he calls "disques intermédiaires," and which, according to him, exhibit rhythmical expansion and contraction about seventy times in a minute, assisting in the circulation of water within the gills. Ann. Sci. Nat. v. No. 1.

According to R. BONNET, all capillaries in the gills of Bivalves are true vessels, provided with a distinct endothelial membrane in *Mytilus edulis*; the same is the case in *Arca* and *Pinna*, but in these they are interrupted in some spots by reticulated sponge-like lacunæ. In fresh-water Bivalves, no endothelium could be found in the gill-vessels. As to the structure of the framework of the gills, the author adopts the three types proposed by Alder and Hancock—(1) thread-like gills in *Mytilus*, *Arca*, and ? *Anomia*; (2) perforated gills in *Mya*, *Pholas*, *Anodonta*, and *Unio*; (3) plaited gills in *Ostrea*, *Cardium*, and *Pinna*; and adds (4) gutter- or groove-shaped gills, consisting of separate plaits without transverse anastomoses, in *Pecten jacobæus*. Morph. JB. iii. pp. 283-327, with 3 pls.

C. POSNER (l. c.) agrees with the former in regarding the filaments in the gills of *Mytilus* as morphologically identical with the rays in *Anodonta*, but admitting the filaments in *Pecten* as of a higher degree of composition, corresponding each to about twenty filaments in *Mytilus* or rays in *Anodonta*, and to the secondary plaits in *Ostrea*. Arch. mikr. Anat. xiv. pp. 132-157, with 1 pl.

The arrangement of the vibratile epithelial cells in the gills of Bivalves is accurately described by C. RABL, Jen. Z. Nat. xi. pp. 349-354, with 1 pl., and by C. POSNER, l. c.

The structure of the gills in *Mytilus*, *Dreissena*, *Anodonta*, *Arca*, and some other genera, has been examined by J. H. PECK. In *Mytilus* and *Arca*, the longitudinal rays are transversely connected only by over-lapping fascicles of cilia, "ciliated interfilamentary junctions," and this is to be regarded as a lower form. In *Anodonta*, true interlamellar junctions by fibrous masses, and remarkable in the relative strength of the correspondent parts in the outer and inner gill, are described. The structure of *Dreissena* is intermediate between these, but nearer to that of *Anodonta*. The final conclusion is, that the gill is

not primitively a membranous plate, but a row of filaments which can be united by coalescence. Q. J. Micr. Sci. (2) xvii. pp. 43-66, pls. iv.-vii.

Peculiar membranaceous fringe-shaped organs on the sides of the trunk between the mantle and the basis of the gill in *Mytilus edulis*, are described by A. SABATIER as "*organes godronnés*;" they contain certain large cells filled with blood, and are probably to be regarded as accessorial respiratory organs. Ann. Sci. Nat. v. No. 1. H. v. IHERING thinks them to be identical with what he has called "epipodial gills" in *Patella* and *Chiton*. SB. Soc. Erlang. ix. p. 136, and JB. Anat. Physiol. vi. p. 115.

The so-called organ of Bojanus in Bivalves is the subject of an elaborate paper by H. A. GRIESBACH; after having mentioned the results of the work of former anatomists with regard to it, he gives a minute description. It consists of two pairs of twisted holes, a superior or exterior (Vorhöhle, entry or fore-court) and an inferior; the superior with plain, the inferior with plaited walls. The two superiors have a common orifice outside; the inferiors open into the superior of the same side. The framework of the whole is formed by conjunctive membranes, without muscles; it receives blood through several clefts from the median venous sinus, not from the pericardium. Its function is probably only excretory, of renal nature, and it is very improbable that water from without is received by the common orifice. The author compares it with the renal organs of the other classes of *Mollusca*, and even with the so-called segmental organs of the *Annelides*. Arch. f. Nat. xliii. pp. 63-107, pls. vi. & vii.

With regard to the *Opisthobranchia*, H. v. IHERING also supports the view that by the communication of the renal organ with the pericardial cavity, water from outside is received, not for being intermingled as a whole with the blood, but only for respiratory purposes, some plaits at the inside of the pericardial sac acting as "pericardial gills." Z. wiss. Zool. xxix. p. 600.

The same author, in a subsequent paper, adduces new proofs in favour of this opinion, stating that in the *Patellidae* and *Rhipidoglossa*, which are the lowest divisions of his *Arthrocochlides*, the kidney is double and quite homologous with the so-called organ of Bojanus in the Lamellibranches, the left one becoming rudimentary; in the *Fissurellidae* and *Patellidae*, the orifice of the genital organs even being situated within this organ, as in some Lamellibranches. Z. wiss. Zool. xxix. pp. 583-614, pl. xxxv. The same abbreviated in Ber. Vers. Naturf. Munich, 1877, p. 170. [The remarkable anatomical resemblances between the *Rhipidoglossa* and the Bivalves have long ago been urged by Cuvier, Quoy & Gaimard, and O. A. Mörch.]

C. SEMPER opposes [as does Simroth; see Zool. Rec. xiii. Moll. p. 6] Ihering's theory, that the pulmonary cavity of the *Stylommatophora* is morphologically homologous with the kidney of the branchiate *Mollusca*; Arb. Inst. Würzb. iii. pp. 480-488. IHERING maintains his views, assigning to *Peronia* and *Veronicellus* the lowest place among his *Nephropneusta*; SB. Soc. Erlang. ix. pp. 131-168.

H. v. IHERING observes that the orifice of the genital organs is within the organ of Bojanus, or kidney, in the *Ostracea*, in *Arca*, and in several *Mytilacea*, but in some species of *Mytilus*, the orifices of both organs are on the same prominence, close to each other; in *Dreissena*, on the contrary, *Pectunculus* and all *Sinupalliata*, except the *Anatinidae*, both orifices are independent. The author regards the former as the lower, the latter as the higher degree of organization. He supports Dall's statement that the products of the genital glands are evacuated in *Patella* by dehiscence through the renal organ [*Zool. Rec.* xiii. *Moll.*, p. 35]; this is also the case in the left side of *Haliotis*, whereas in *Fissurella* the genital orifice is inside the opening of the renal organ. *Z. wiss. Zool.* xxix. pp. 583-614, pl. xxxv.

W. v. NATIUSIUS has published a work (*suprà*, p. 5), in which he endeavours to prove that the shells of Mollusks do not grow only by apposition, but that an extension of the shelly substance by intus-susception must be admitted. For this purpose, he enters very minutely into the microscopic structure of the shells, especially of *Strombus gigas*, pl. iv. figs. 21-26, and *Mytilus edulis*, pls. v.-xi. The chief points leading to this conclusion are apparently the following:—

(1) The single prisms of the prismatic layer of a young *Anodonta* are smaller in diameter than those of an adult shell at the same absolute distance from the summits (p. 97).

(2) The blue shelly layer in *Mytilus edulis* shows a distinct increase in thickness about the middle of the shells and another near the edge, in old and in young shells, but at the same absolute distance from the summits the thickness is different in old and young shells (p. 77).

(3) The minute disposition of the same blue layer, the nacreous layer, the shelly ridges to which the ligament is attached and the outside cuticle, as shown by transverse sections in full-grown and young shells of *Mytilus edulis* (pl. viii. figs. 44 & 45), show differences which cannot be explained by simple apposition from within and erosion from without, but only by increase of the thickness of the blue layer. The author calls attention to the structure of the "schlossbandwall," or ligamental ridge (*nymphæ*, Linné), which is perforated by five channels.

A peculiar gland in connection with a hollow perforated sting within the orifice of the genital organs in *Asteronotus*, family *Dorididae*, has been described by R. Bergh, *JB. mal. Ges.* iv. p. 161.

A peculiar horny sting connected with the penis and containing stellate cells, found in *Onchidium*, by Semper, *Arch. mikr. Anat.* xiv. p. 123.

Note on the hermaphroditical gland of *Amphorina*, by S. TRINCHESE, *Mem. Acc. Bologn.* (3) vii. p. 463.

EMBRYOLOGY.

E. R. LANKESTER supposes an original simple circle of cilia round the mouth which he calls "*architroch*," as the common origin of the vibratory apparatus of the *Rotifera*, the tentacular crown of the *Polyzoa*, the arms of the *Brachiopoda*, the oral appendages (palps) and gills of the Bivalves, which therefore all would be morphologically homologous. *Q. J. Micr. Sci.* (2) xvii. pp. 423-428.

Note on the germinal vesicle in *Mollusca*, by S. Trinchese, Mem. Acc. Bologn. (3) vii. p. 463.

W. K. BROOKS compares the embryonal stage of the *Mollusca*, provided with a ciliated veil, which he calls *Veliger*, with the *Polyzoa*, especially those which bear a lophophore, and regards *Dentalium* as the lowest among the Mollusks, from which Bivalves and Gastropods are to be deduced. P. Bost. Soc. xviii. [1876] pp. 225-236.

The first changes in the egg of *Neritina fluviatilis*, and the development of *Paludina vivipara* [Listeri] have been observed by O. BÜTSCHLI, in the latter also the original orifice of the Gastrula becomes the vent of the adult animal; to this stage succeeds one called "*Trochosphaera*," with a ring-like girdle of cilia round the midst of the body. Eyes and otocysts have their origin in an invaginated part of the ectoderm. Z. wiss. Zool. xxix. pp. 216-239, pl. xv.-xvii.

The segmentation of the yolk, and the part which the germinal vesicle takes in it, observed in *Limnæa stagnalis* and *Anodonta*, by A. BRANDT, op. cit. xxviii. pp. 586-606, pl. xxvii.

Egg of *Facelina drummondi* (Ald. & Hanc.), fam. *Æolidiæ*, microscopically described by S. Trinchese, Rend. Acc. Bologn. 1877, May, 12 pp. 1 pl.

The formation of the egg in *Scrobicularia piperata* is described by H. VON IHERING, Z. wiss. Zool. xxix. pp. 1-14, pl. i. He comes to the conclusion that in Bivalves the membranes of the egg are produced by the egg itself.

E. R. LANKESTER, in a general paper on the embryogeny and classification of the animal kingdom, recapitulates his observations and views as to the embryology of many *Mollusca*; and gives a sketch of a new classification in which the *Mollusca* are derived directly from the *Gephyrea*, and placed as usual between the *Articulata* and *Vertebrata*; they are subdivided, partly in accordance with Ihering's views, as follows:—

Branch A.—Eucephala [Céphalés, Lam.]

Grade A.—Lipoglossa, Class Scolecomorpha, gen. *Neomenia*.

Grade B.—Echinoglossa, Class I., Gastropoda; II., Cephalopoda, including the Pteropods; and III., Scaphopoda (*Dentalium*).

The Gastropods are thus subdivided:—

Grade *a*.—Amphineura. Order.—Polyplacophora (Blainv.), *Chiton* and *Chitonellus*.

Grade *b*.—Cochlides. Ord. 1.—Autocochlides [Prosobranchia], *Patella* and *Buccinum*.

Ord. 2.—Natantia [Heteropoda], *Atlanta* and *Pterotrachea*.

Ord. 3.—Cryptocochlides [Opisthobranchia], *Aplysia* and *Eolis*.

Ord. 4.—Pulmonata [Cuv.], *Limax* and *Limnæa*.

Branch B.—Lipocephala [Acephala, Cuv.].

Class I., Tentaculibranchia (Bryozoa); II., Spirobranchia (Brachiopoda); III., Lamellibranchia.

Q. J. Micr. Sci. xvii. pp. 448 & 449.

BIOLOGY.

Helix fusca (Mont.), active in mid-winter, at a temperature of 26°-28° Fahr.; Ashford, Q. J. Conch. 1877 (No. 10), p. 180.

Bulimus pallidior (Sow.) two years and two months in a box without food, remaining alive. *Helix veatchi* (Stearns), six years under similar circumstances, Stearns, P. Cal. Ac. Oct. 18, 1875, = Conchological Memoranda, No. xiii. of the author, also in Am. Nat. xi., Ann. N. H. (4) xix. p. 355, and Q. J. Conch. 1877 (No. 11), pp. 218 & 219.

Limnaea stagnalis (L.), discharging a pale violet coloured liquid [blood?]; Nelson, Q. J. Conch. 1877 (No. 11), p. 216.

"Aplysiopurpurin," colouring matter of the purple fluid emitted by *Aplysia*, and also colouring the foot of a species of *Doris*, and "Janthinin," colouring matter of the purple fluid emitted by *Janthina*, chemically and spectroscopically examined by Moseley, Q. J. Micr. Sci. (2) xvii. pp. 12-14, pl. ii. figs. 13-15.

ABNORMALITIES.

A specimen of *Helix nemoralis*, bearing a fleshy cylindrical appendage on the back of the tail, observed by P. Fischer, J. de Conch. xxv. pp. 211 & 212, pl. iv. fig. 4.

Sinistral specimens of *Buccinum undatum* (L.) have also the internal organs on the reversed side; Ihering, Nachr. mal. Ges. 1877, pp. 51 & 52. [This has long been known in sinistral specimens of land-shells.]

Sinistral specimen of *Helix aspersa* (Müll.), and *hortensis* (Müll.), found at Bristol, by Miss Hele, Q. J. Conch. No. 12, p. 248; of *Helix virgata* (Mont.), near Pollington, Lister Peace, *ibid.* No. 10, p. 174; of *Succinea elegans* (Risso), Baudon, J. de Conch. xxv. p. 354, pl. xi. fig. 3.

Dextral specimen of *Bulimus* (*Chondrula*) *quadridens* (Müll.), which is normally sinistral, found by V. Gredler, Nach. mal. Ges. 1877, pp. 1 & 2.

Distorted specimen of *Succinea elegans*, Baudon, J. de Conch. xxv. p. 354, pl. xi. fig. 4.

Albino varieties of *Helix hispida* (L.), Taylor, Q. J. Conch. No. 11, p. 216, of *Bulimus obscurus* (Müll.), Miss Hele, *ibid.* No. 12, p. 248, of *Clausilia biplicata* (Mont.), Taylor, *ibid.* No. 11, p. 216, Daniels & Mrs. Fitzgerald, *ibid.* No. 12, pp. 247 & 248, of *Limnaea peregra* (Müll.), Lister Peace, *ibid.* No. 10, p. 174. Hyaline variety of *Cochlicopa* [*Cionella*] *lubrica* (Müll.), Miss Hele, *ibid.* No. 12, p. 248.

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESHWATER MOLLUSCA.

C. P. GLOYNE gives general remarks on the geographical distribution of the terrestrial Mollusks, beginning with the northern region of the Palearctic Province. Q. J. Conch. No. 13, pp. 283-288.

C. WESTERLUND, "Fauna europæa Molluscorum extramarinorum,"

gives a condensed synopsis of the known European land-shells, with Latin diagnoses and short indication of habitat; the first part, all yet published, contains *Daudebardia*, *Glandina*, *Arion*, *Limax*, *Pharmacella*, *Vitrina*, *Hyalina*, *Zonites*, *Leucochroa*, *Helix*, *Buliminus*, and *Cochlicopa* (*Cionella*). Some objections with regard to single species by W. Kobelt, JB. mal. Ges. iv. pp. 272-275.

W. KOBELT publishes numerous additions and corrections to his "Catalog der im europäischen Faunengebiet lebenden Binnenconchylien" [see Zool. Rec. viii. p. 122]. JB. mal. Ges. iv. pp. 15-45.

W. KOBELT has published a new volume of Rossmässler's Iconographie der Land- und Süsswasser-Mollusken [see Zool. Rec. xii. p. 141], describing and figuring a large number of terrestrial shells and *Limnæidæ* from Europe, Northern Africa, and Western Asia, not yet, or not sufficiently treated in the preceding volumes; it contains nearly all novelties of the genera *Helix*, *Bulimus*, *Vitrina*, and *Daudebardia* detected in the last twenty years in these parts of the world. The author generally uses a sound judgment with regard to specific distinctions, and gives interesting observations upon geographical distribution. The figures are generally good; some few are copied from other authors.

Some notes on Kobelt's continuation of Rossmässler's Iconography, concerning single species, by the Recorder, *tom. cit.* pp. 185-194.

Suggestions for finding the smaller land-shells by sifting, by H. Laver, Q. J. Conch. No. 13, p. 264. [This course has been successfully employed in Germany by Dr. Reinhardt.]

1. Northern and Central Europe.

New for the British Fauna: *Helix villosa* (Drap.) found near Cardiff, Glamorganshire, by D. ROBERTSON, Ann. N. H. (4) xix. p. 199. New localities for rare British species: *Zonites glaber* (Stud.), near Leeds, by H. CROWTHER, Q. J. Conch. No. 11, p. 215; *Limax gagates* (Drap.) at Hastings, by J. W. TAYLOR, *ibid.*, No. 12, p. 245; *Helix lamellata* (Jeffr.) in Kirkcudbrightshire, by R. RIMMER, *ibid.*, No. 13, p. 265; *Vertigo moulinsiana* (Dupuy) at Winchester, by H. GROWE, Ann. N. H. (4) xix. p. 432, and Q. J. Conch. No. 12, p. 230; *Ancylus fluviatilis* var. *gibbosa* (Bourg.) near Leeds, by W. NELSON, Q. J. Conch. No. 10, p. 186, and two other places in Yorkshire, by H. CROWTHER, *ibid.*, No. 11, p. 215.

Guernsey and Jersey. Occurrence and habits of *Helix pisana* (Müll.) by Sheriff Tye, Q. J. Conch. No. 12, pp. 130-133; of *H. revelata* (Mich.) by R. Rimmer, *ibid.*, No. 11, p. 206.

S. CLESSIN has finished his "Deutsche Excursions-Mollusken-Fauna," 581 pp., containing descriptions and moderate woodcuts of all known terrestrial and freshwater Mollusks of Germany.

Oldenburg. 34 sp. of terrestrial and 44 of freshwater *Mollusca* enumerated by H. v. Heimburg, Nachr. mal. Ges. ix. pp. 18-21.

Poland. A list of 105 terrestrial and 55 freshwater species, including *Helix austriaca*, *nemoralis* and *hortensis*, *bidens* and *unidentata* [*Cobresiana*], *Clausilia commutata* (Rossm.), and 7 other species of this genus,

Lithoglyphus fuscus, &c., by [A. SŁOSARSKI, Bull. Soc. Zool. Fr. 1877, pp. 291-299. This author has given some notes on the same subject at the meeting of the Russian naturalists at Warsaw, Sept. 1876.

Thuringia. The Mollusks living in the mountains of this province are enumerated, partly from personal observation, by the Recorder. On the summits, more than 2000 feet above the sea, only *Limax marginatus* (Müll.), *agrestis* (L.), *Arion ater* (L.), and *Hyalina pura* (Stud.) have been found. In the woods of the higher slopes and declivities, snails are rather rare, and it is only at a few points, where steep and bare pieces of rocks, exposed to the sun, make their appearance, that a larger number of species and individuals is to be found. *Limnaea ovata* (Drap.), *peregra* (Müll.), and *Ancylus fluviatilis* (Müll.), are the only freshwater-shells found in the rivulets and ponds above 1400 feet. The number of species and individuals increases very considerably as soon as one reaches the large belt of fossiliferous limestone bordering the chain of mountains to the north and south; Martens, JB. mal. Ges. iv. pp. 213-237, also SB. nat. Fr. 1877, pp. 15-18. A list of 39 terrestrial and 1 freshwater-shells found at Sulza and Koesen in the flat fossiliferous limestone region of Thuringia by Reinhardt; Nachr. mal. Ges. 1877, pp. 36-38. Some shells found near Eisenach, including *Azeca menkeana* (C. Pfr.) indicated by Böttger, *tom. cit.* pp. 97 & 98.

Bavarian Forest Region. In the granitic mountains between Bavaria and Bohemia, only 8 terrestrial and 13 freshwater *Mollusca* have been found by S. Glessin; Nachr. mal. Ges. 1877, pp. 39-42.

S. GLESSIN discusses the forms of freshwater *Mollusca* peculiar to the great lakes of Southern Germany, distinguished by the thickness of the shell and most of them also by the shortness of the spire, and also those found by Forel in deep water in the Swiss lakes, distinguished by small size and very thin shells. He inclines to regard them as distinct species. The *Mollusca* living on the open shores of these lakes, subject to the agitation of the waves, are limited to the genera *Limnaea*, *Planorbis* (only one species), *Valvata*, *Anodonta*, and *Pisidium*; those living in depths of 25 metres and upwards, to *Limnaea*, *Valvata*, and *Pisidium*. The author inclines to regard both as species distinct from those living in ponds and rivers, though descendant from them. Mal. Blätt. xxiv. pp. 159-170. For new species, see below.

Tirol. A few shells found in the Zillerthal enumerated by Glessin, Nachr. mal. Ges. 1877, pp. 43 & 44.

Engadine. *Succinea amphibia* [*putris* (L.)] and *Planorbis leucostoma* found at Pontresina, 6000 feet above the level of the sea. Giebel, Z. ges. Naturw. (2) ii. p. 229.

Lyons. A. Locard publishes a treatise on the malacological fauna, chiefly from materials in the collection of A. P. Terver (deceased), and with special regard to the varieties of the different species; diagnostic descriptions of each species are given in French in an appendix. He enumerates 95 terrestrial and 49 freshwater species, 16 of which are Bivalves. As species of not universal distribution may be mentioned among others, *Limax gagates* and *variegatus*, *Testacella*, *Vitrina annularis*, *Helix personata*, *sylvatica*, *cantiana*, *carthusiana*, *plebeia*, *unifasciata*,

variabilis, *trochoides*, *acuta*, *Bulinus tridens* and *quadridens*, *Pupa quinque-dentata* and *granum*, 5 species of *Bithynia* [*Bithynella*]; *Dreissena polymorpha* is now very common, but was not represented in Terver's collection [it is of recent introduction]. Generally the fauna is that of the central mountainous parts of Europe, with some peculiarly Southern or Western additions.

Thirty-eight terrestrial and 29 freshwater shells living near and in hot springs at Barbotan, dep. Gers, are enumerated by D. DUPUY, J. de Conch. xxv. pp. 15-23; among them, *Pupa dilucida* (Ziegl.) is new for France and *Unio requieni* has not yet been known to live in warm water.

Toulouse. The Mollusks living near that city are reviewed and some wrong statements eliminated by M. P. Fagot, Bull. Soc. Toulouse, ix. [1875]. Generally, the fauna more nearly resembles that of Agen and the Gironde than that of Languedoc. Fischer, J. de Conch. xxv. pp. 313-315.

2. Southern Europe and Asia Minor.

Pyrenees. 50 terrestrial and 2 freshwater species (*Ancylus* and *Hydrobia*) observed at Caunterets by P. Fischer, J. de Conch. xxv. pp. 49-56.

Notes on the Mollusks of the Hautes-Pyrénées by M. P. Fagot and de Nansouty, in a pamphlet of 30 pp. without date; see J. de Conch. xxv. pp. 312 & 313.

Provence. 65 terrestrial and 11 freshwater species observed at Lamalou-les-bains, dep. Herault, by Letourneux, R. Z. (3) v. pp. 336-353.

Helix telonensis and some allied species, some new, from the mountains of Southern France, described by Bourguignat, R. Z. (3) v. pp. 232-249.

Portugal. A. Morelet gives critical notes and additions to his "Description des Mollusques terrestres et fluviatiles du Portugal," published in 1845. From 118 the number of species is increased, to 151, 99 terrestrial, 49 freshwater, and 3 brackish water species. *Unio velhovichii* of the former publication is to be cancelled, being a foreign shell; *Helix candidula* of the same is a variety of *caperata* (Mont.), *Pupa secale* = *lusitanica* (Rossm.), *Clausilia rugosa* = *moniziana* (Lowe), *Planorbis corneus* = *metidjensis* (Forbes), *Unio tristis* = *margaritifera*, juv. Among the additions, 4 only are not found elsewhere. *Helix circumscissa* (Shuttl.), is a Canarian species, found also at Oporto. J. de Conch. xxv. pp. 242-261.

Littoral Austria. The malacological fauna of Görz and Gradisca near the Adriatic is the subject of an interesting treatise by F. Erjavec, cited above; he distinguishes five regions: (1) the Alpine, characterized by *Vitrina diaphana*, *Helix phalerata* and *chamæleon*, *Pupa muscorum*, var. *madida*, *Clausilia bergeri* and *succinea*; (2) the middle mountainous region, up to 1260 mètres, agreeing mostly with the fauna of Carniolia; (3) the plain of the Isonzo and the valley of Wippach, containing some

more southern species, as *Testacella*, *Helix cespitum* and *cincta*, &c.; (4) the Karst, very dry and poor in Mollusks, *Clausilia biasoletiana* (Charp.), being the only peculiar species; (5) the sea-shore, or littoral region, exhibiting many decidedly South-European species, as *Helix pisana*, "*Bulminius*" *acutus*, *Stenogyra decollata*, *Clausilia papillaris*, &c. Altogether, 140 terrestrial, 57 freshwater, and 3 submarine species (*Auriculida* and *Truncatella*) are enumerated.

Some notes on terrestrial shells of Lombardy, by N. Pini, Atti Soc. Ital. xix. pt. 4.

Northern Apennines. P. Strobel enumerates 69 terrestrial and 13 freshwater species found on the northern slope of the Apennines between the rivers Tidone and Secchia, S.W. of Modena, Central-European and Southern species being intermingled, e.g., *Helix fruticum*, *hispida*, *pomatia*, *Bulminius detritus*, *Balea fragilis*, and *Clausilia laminata* among the former, *Hyalina olivetorum*, *Helix lucorum*, *cincta*, *caespitum*, *Pupa variabilis*; the former are not found on the southern slope, where *Helix cingulata*, *planospira*, *aspersa*, *aperta*, *variabilis*, *Pupa cinerea* and *Clausilia papillaris* make their appearance; 41 species are common to both slopes, 46 confined to the northern, 18 to the southern slope. Bull. Soc. mal. Ital. iii. pp. 81-135.

Abruzzi. Additional notes on the land shells by Tiberi, Bull. mal. v. [1872] pp. 14-31.

Capri. 34 land shells and 1 freshwater species, *Bithynia similis* (Drap.), enumerated by Miss J. Fitzgerald, Q. J. Conch. No. 12, pp. 249-251.

Corsica. A list of terrestrial and freshwater shells has been published in 1872 at Ajaccio, together with a list of rare and remarkable plants, by R. J. S. (? Shuttleworth), see J. de Conch. xxv. p. 295.

Malta. 22 land-shells collected by G. Schweinfurth, one new, enumerated by the Recorder, Bull. mal. vi. [1873] pp. 26-29.

Smyrna. Terrestrial shells collected by Prof. G. Fritsch, determined by the Recorder, SB. nat. Fr. 1877, pp. 196 & 200.

3. Northern Asia.

Siberia. C. A. WESTERLUND recapitulates all hitherto known concerning its land and freshwater Mollusks, and fully describes those collected on the Yenisei expedition by Prof. A. Nordenskiöld and Dr. A. Stuxberg in 1875 & 1876, in North-western Siberia, viz., 29 terrestrial and 35 freshwater species belonging to the genera *Arion*, *Limax*, *Vitrina*, *Hyalina*, *Helix*, group *Eulota*, *Trichia*, *Vallonia*, and *Patula*, also *Cochlicopa* [*Cionella*], *Pupa*, subgen. *Pupilla* and *Vertigo*, *Succinea*, *Limnea*, *Physa*, *Planorbis*, *Valvata*, *Bythinia*, *Anodonta*, and *Sphærium*, incl. *Calyculina* and *Pisidium*; for the most part, European species, some new, but very like others from Northern Europe. Sv. Ak. Handl. (2) xiv. pt. 2, No. 12, 111 pp. 1 pl.

Two species of *Succinea* and 18 species of freshwater shells, including *Planorbis borealis* (Lovén) and *Cyelas asiatica* (Martens, 1864, hitherto only known in the fossil state), the rest well-known European species,

collected by Dr. O. Finsch on the banks of the Obi, 61°-66° N. lat. Some other European species of *Limnæa* and *Anodonta* in South-Western Siberia, *A. piscinalis* in Lake Saisan, and *Limnæa stagnalis*, *palustris*, *ovata*, *Planorbis marginatus*, *spirorbis* (Rossm., = *dazuri*, Mörch), *Bithynia leachi*, and *Valvata piscinalis* in Lake Alakul, *Helix rubens* and *semenowi* (Mart.) on the mountain Alatau. Martens, SB. nat. Fr. 1877, pp. 237-242.

Some scattered notes concerning terrestrial shells at the banks of the Yenissei river are to be found in H. THÉEL'S "Relation de l'expédition Suédoise de 1876 au Yenissei." Upsala: 1877, pp. 14, 19, & 33.

Persia. Some freshwater-shells collected by G. Fritsch, SB. nat. Fr. 1877, pp. 196 & 200.

Japan. Notes on small terrestrial shells, *Hyalina*, *Helix*, *Pupa*, *Carychium*, *Alyceus*, some new, by Reinhardt, JB. mal. Ges. iv. pp. 313-325, pls. ix.-xi., and SB. nat. Fr. 1877, pp. 67-71. A list of 58 terrestrial and 24 freshwater species, collected by Dr. Hilgendorf and W. Dönitz in Japan, chiefly near Yeddo, but also at Hakodate, containing some new species, with some general remarks on the circumpolar, North-eastern and South-eastern Asiatic affinities of the Japanese fauna, by E. v. MARTENS, SB. nat. Fr. 1877, pp. 97-123.

China. New species of freshwater bivalves from the provinces of Nanking and Honan by Heude, Conch. fluv. de Nanking, fasc. iii. pls. xvii.-xxiii.

4. Africa. -

General notes on the insular faunas of land shells generally, and especially those of the Azores, Madeira, Canaries, and Cape Verde Islands, with lists of the known species, by W. Kobelt, JB. mal. Ges. iv.

Central Africa. *Planorbis rueppelli* (Dkr.), *Isodora contorta* (Mich.), *Limnæa natalensis* (Krauss), and *Melania tuberculata* (Müll.), found near Kuka, Bornu, by G. Rohlf; Martens, SB. nat. Fr. 1877, p. 242.

Lake Nyassa. 25 species of freshwater-shells enumerated, many new, collected by F. A. Simons, and described by E. A. Smith, P. Z. S. 1877, pp. 712-719. They belong to the genera *Melania* (including the widely-spread *M. tuberculata*, Müll.), *Lanistes*, *Paludina*, *Bithynia*, and *Physa*.

Ascension Island. *Helix similis* (Fér.) is the only known land shell; Martens, SB. nat. Fr. 1877, pp. 14 & 15, and MB. Ak. Berl. 1877, p. 271.

Zanzibar. Nine apparently new land shells described by J. W. Taylor, Q. J. Conch. No. 12, pp. 251-255, pl. ii. and No. 13, pp. 280-283, pl. iii.

Comoro Islands. 22 terrestrial and 6 freshwater species collected on the island Anjoana by M. Bewsher, described by A. Morelet, some new, with a list of all known, J. de Conch. xxv. pp. 325-347, pls. xii. & xiii.

Madagascar. 19 terrestrial and 7 freshwater shells, some of them new, from Ekongo on the South-east coast of Madagascar, enumerated by G. F. Angas, P. Z. S. 1877, pp. 527 & 528; new species of *Helix*, id. l. c., pp. 803-805, pl. lxxx.; new land shells by A. Morelet, J. de Conch. xxv. pp. 217-219.

Mauritius. 52 inoperculated, 25 operculated land shells, 19 freshwater shells (no bivalve), and 6 of brackish water (*Auriculidæ*, *Truncatella*); *Seychelle Islands*, 18 inoperculate, 3 operculate land shells, 3 freshwater shells, and 4 *Auriculidæ*; *Chagos Islands*, no true terrestrial or freshwater species, 1 *Auriculid*, enumerated by E. Liénard in "Catalogue de la faune malacologique de l'île Mauritius." Additions to the fauna of Mauritius, containing a new *Cyclostoma* and a new *Melampus*, by Morelet, J. de Conch. xxv. pp. 212-216.

5. Tropical Asia.

S. HANLEY & W. THEOBALD have concluded their "Conchologia Indica," illustrating the land and freshwater shells of British India, with part viii., "not because it is complete," but because it is "impossible to keep pace with modern discoveries."

The species of *Ampullaria*, *Larina*, and *Paludina* living in India are accurately discussed, their synonymy established, and many varieties pointed out from extensive material, by G. Nevill, Cat. moll. Mus. Calcutta, fasc. i. 42 pp.

Yunnan and Upper Burmah. The shells collected by Dr. Anderson in the expeditions of 1868 and 1874 are enumerated, and those ones not published as new by W. T. Blanford, P. Z. S. 1869, described by G. NEVILL, J. A. S. B. xlv. pt. 2, pp. 14-41; figures of these new species will be given in the "Report of the Zoology of Yunnan," which the Recorder has not yet seen. The author states that they belong to a common Indo-Chinese fauna, and points out some faint resemblances to American species.

India and Burmah. New land and freshwater shells described by W. Theobald, J. A. S. B. xlv. pt. 2, pp. 183-189, pl. xiv.

Assam. *Cyclostomacea* and *Helicidæ* from the Dafia Hills; H. H. Godwin-Austen, *tom. cit.* pp. 171-183, pl. vii. & pp. 311-318, pls. viii. & viii. A. 33 species are enumerated (all of the operculated group), of which 11 are new. No *Cyathopoma*, *Georissa*, or *Hydrocæna*. Several marked varieties are mentioned.

6. Australian Region.

Moluccas and New Guinea. 14 terrestrial, 14 freshwater, and 4 brackish water species of Gastropods (no freshwater Bivalves) found on the island Sorong, N.W. of New Guinea, 8 terrestrial and 13 freshwater Gastropods on the Moluccas; C. TAPPARONE CANEFRI, Ann. Mus. Genov. ix. pp. 284-299.

West Australia, New Guinea, New Britain, New Ireland, and New Hanover. Land and freshwater shells collected by T. Studer on the expedition of the German corvette "Gazelle," enumerated by v. MARTENS, MB. Ak. Berl. 1877, pp. 261-291, with 2 pls.

Australia. List of 38 known land shells from Richmond River, New South Wales, by H. F. PETTARD, J. de Conch. xxv. p. 356-362. List of 24 land shells, including 5 *Auriculidæ*, collected in Fitzroy Island by J. BRAZIER, Q. J. Conch. No. 13, p. 268-275. New land shells and a

freshwater shell, *Paludinea gilesi*, sp. n., from Lake Eyre, by G. F. ANGAS, P. Z. S. 1877, pp. 33 & 170.

Tasmania. Some notes on its land snails, by W. F. Pettard, J. de Conch. xxv. pp. 261-263.

Amsterdam Island. One terrestrial species only has been found by the French Expedition, a small not determined species of *Helix*; Vélain, Arch. Z. expér. vi. p. 125.

Kerguelen Island. *Helix hookeri* (Rv.), is the only terrestrial species; E. A. Smith, Kidder & Studer, l. c.

7. America.

H. C. YARROW's Report on the terrestrial and fluviatile *Mollusca* collected during Wheeler's Survey in portions of Colorado, Utah, New Mexico, and Arizona (title, *suprà*), contains bibliographical and synonymical references, with localities of 11 species of *Helicidae*, 5 *Vitridae*, 3 *Succiniidae*, 11 *Physidae*, 7 *Limnæidae*, 2 *Planorbidae*, 1 *Valvatidae*, 1 *Viviparidae*, 1 *Rissoideae*, 1 *Cyrenidae*, 2 *Pisidiidae*, and 2 *Unionidae*. Only one species (*Anodonta dejecta*, described by James Lewis, l. c. p. 952, Arkansas River) is new. Varieties of *Helix strigosa*, Gould, are referred to, including *H. hemphilli*, Newc., *haydeni*, Gabb, and ? *idahoensis*, Newc. *Tryonia* (? *exigua*, Conrad) is also represented, from Utah.

Florida Keys. Their land shells partly derived from the Southern States of North America, partly from the West Indies, with a slight preponderance of the latter; L. F. de Pourtalès, Am. Nat. xi. p. 143.

P. FISCHER & H. CROSSE have continued their work on the land and freshwater Mollusks of *Mexico and Central America*, treating in the sixth part of it, pp. 545-624, the rest of *Bulimulus*, the genera *Simpulopsis*, *Cæcilianella*, *Opeas*, *Spiraxis*, and the commencement of *Leptinaria*, the plates 25-28 contain also figures of *Succinea*, *Vaginula*, *Limnæa*, and *Physa*. New species from Guatemala and Mexico, by CROSSE & FISCHER, J. de Conch. xxv. pp. 271-273.

Porto Rico. 11 species of operculate, 40 of inoperculate terrestrial, and 9 freshwater species, collected by J. Gundlach & L. Krug are enumerated and discussed by E. v. MARTENS, JB. mal. Ges. iv. pp. 340-362; some new or less known figured, pl. xii.

Ecuador. 8 new land-shells described by E. A. SMITH, P. Z. S. 1877, pp. 361-365, pl. xxxix.

Galapagos. 3 species of *Bulimus*, and a new *Succinea*, collected on Charles Island by Commodore Cookson; *id.* l. c. p. 72; abstract, Nachr. mal. Ges. 1877, p. 91.

Argentine States. The part of P. STROBEL's "Malacostatica dell' Argentina" published in 1877 continues the introduction to the special part [see Zool. Rec. xii. p. 145], giving a physico-geographical description of the country, its plains (Pampas), mountains, rivers, lagoons, etc., and finishing with a table of hypsometrical data compiled from various sources.

H. WEJENBERGH briefly refers to the Molluscan fauna in R. Napp's "Die Argentinische Republik" (Buenos Ayres: 1876, 8vo), pp. 170-172.

b. MARINE MOLLUSCA.

1. Northern Seas.

JEFFREYS gives a list of 39 Bivalves, 11 *Solenocoencha*, and 22 Gastropods, dredged by himself in depths exceeding 1000 fathoms, in the "Valorous" Expedition. There is no general resemblance between them and the shells of the cretaceous period, the latter being deep water forms. Rep. Brit. Assoc., Aug. 1877, address to the Biological Section; extract in Nachr. mal. Ges. 1877, pp. 87-90. Notes on the *Solenocoencha* procured in the "Valorous" Expedition, *id.* Ann. N. H. (4) xix. pp. 153-158; *Patellidae*, *Trochidae*, *Littorinidae*, *Pyramidellidae*, &c., of the same Expedition, *id.* l. c. pp. 231-243; *Eulimidae*, *Buccinidae*, *Muricidae*, *Pleurotomidae*, *Bullidae*, *Pteropoda*, &c., *id.* l. c. pp. 317-339.

Thirty-four species of *Mollusca* collected by Capt. H. W. Feilden and Mr. H. C. Hart in Davis Straits, Baffin's Bay, and further north to 81° N. lat., during the Arctic Expedition of 1873-76, are enumerated by E. A. SMITH, Ann. N. H. (4) xx. pp. 131-146; they are all known Arctic species, at least 16 of them are also found on the Atlantic coast of the United States, only 4 or 5 in European seas. The species from the high latitudes, 79-81° N. lat., will be mentioned below.

Newfoundland and Nova Scotia. List of 92 shells collected by T. A. VERKRÜZEN, Nachr. mal. Ges. 1877, pp. 52-57.

White Sea. Notes on its malacological fauna, *Chio borealis* being very numerous, by Prof. WAGNER, at the meeting of Russian naturalists at Warsaw, Sept. 1876 (*Z. wiss. Zool.* xxvii. p. 385).

G. O. SARS has published two plates containing good figures of Arctic sea-shells of the genera *Buccinum*, *Neptunea*, &c., illustrating a pamphlet on the practical application of autography in zoology, and a new autographic method. (Christiania: 1877, 8vo.)

Northern Norway. New or rare marine shells, by FRIELE, N. Mag. Naturv. xxiii. [1876]; JB. mal. Ges. iv. pp. 257-264.

List of 114 sea-shells obtained by two days' dredging at Oban, by A. M. NORMAN, Q. J. Conch. No. 13, pp. 275-279.

New British *Nudibranchiata*, by GOSSE, Ann. N. H. (4) xx. p. 316, and NORMAN, *tom. cit.* pp. 517 & 518.

Northern French species of *Paludestrina* and *Peringia* [saltwater species of *Hydrobia*], many new, by BOURGUIGNAT, Spec. novissim. moll. 1876, and MABILLE, R. Z. (3) v. pp. 215-220 & 301-309.

2. Seas of Southern Europe.

G. HIDALGO has published parts 13 and 14 of his work on the marine Mollusks of Spain and Portugal, discussing the Bivalves, and figuring species of *Trochus*, *Arca*, and *Psummobia*; a supplement to the bibliography is also given.

E. DUBREUIL publishes popular descriptive notes on the Cephalopods, Pteropods, and Gastropods found on the sea-shore of Southern France,

in a little book, "Promenades d'un naturaliste sur le littoral de Cette à Aigues-Mortes, Montpellier," &c. (Paris: 1877, 120 pp.)

A. T. MARION has published a list of shells dredged in depths from 60 to 350 mètres, off Marseilles; Rev. Montp. iv. [March, 1876], abstract in J. de Conch. xxv. p. 290.

List of 182 shells found in the roadstead of Civita Vecchia, two new, by A. DE MONTEROSATO, Ann. Mus. Genov. ix. p. 407.

Algeria. MONTEROSATO enumerates 148 marine species, adding several interesting notes concerning their varieties and systematic value; J. de Conch. xxv. pp. 24-49.

Southern French and Algerian species of *Paludestrina* and *Peringia*, many new, by BOURGUIGNAT, Spec. novissim. moll. 1876, and MARILLE, R. Z. (3) v. pp. 220-224 & 310-312.

Sea shells from the eastern part of the Mediterranean, from the Black and Caspian Seas, collected by G. Fritsch, with general remarks about the fauna of those seas, that of the Black Sea having the same relation to the Mediterranean as the Baltic to the Northern Atlantic; v. MARTENS, SB. nat. Fr. 1877, pp. 197-200.

Caspian Sea. O. A. GRIMM has continued his successful researches on its fauna, describing several new species, and stating the occurrence of others at various depths. The majority of the shells hitherto known are from a depth limited to 140 feet, but *Cardium catillus* reaches from 161 to 630 feet, *Dreysena rostriformis* 161 to 910 feet, *Hydrobia caspia* to a depth of 1050 feet. Kaspinskoe more i ego fauna, pt. 2, with 3 pls., tables of depths (in sashines, of which one = 7 feet), pp. 96 & 97.

Lake Aral. Note on its *Mollusca* by W. D. ALENITZYN, Meeting of Russian naturalists at Warsaw, September, 1876; Z. wiss. Zool. xxviii. pp. 406 & 407. The author distinguishes two zones—the upper, which is agitated by wind, and the under, beginning at a depth of 140 feet, which is always tranquil—and points out how the *Mollusca* of the upper zone are specially enabled to resist the movement of the waves, by the presence of a byssus, by a very large foot, by burrowing in the sand, &c. The species are the same as in the Caspian Sea.

3. Tropical Atlantic.

Western Africa. 144 marine species, some new, enumerated by MARRAT, Q. J. Conch. No. 12, pp. 237-244.

West Indies. O. A. L. MOERCH has continued his list, which is very accurate and elaborate as to synonymy, discussing the families *Strombida*, *Tritonida* [*Ranellida* and *Cassidida*], *Cypræida*, *Amphiperasida*, *Naticida*, *Velutinida*, *Capulacea*, *Onustida*, and *Vermetida*; Mal. Bl. xxiv. pp. 14-67, 93-123.

4. Indian Ocean.

Red Sea. General and historical notes on its malacological fauna, by PAGENSTECHER, in KOSSMANN'S Zool. Ergebnisse, i. pt. 2, pp. 1-15; enumeration of 126 species found by the latter, chiefly at Massowa and

the Dahlak Islands, pp. 16-60. Notes on the conchological fauna of the Red Sea, compared with that of other seas, chiefly from the publications of Weinkauff and Issel, by APPELIUS, Bull. mal. vi. [1873] pp. 12-24.

Persian Gulf. New species of the genera *Terebra* and *Pleurotoma* collected by Col. Pelly, described by E. A. SMITH, Ann. N. H. (4) xix. pp. 225, 227, 229, & 491.

Mozambique. A few marine shells collected by F. A. Simons at Quelimane enumerated; *id.* P. Z. S. 1877, pp. 719-721.

Mauritius, 878 species, *Seychelle Islands*, 102, *Chagos*, 244, *Rodriguez*, 45, *Cargados*, 92 species, of sea shells observed hitherto on each of these islands by E. LIÉNARD, Cat. de la faune mal. &c. (Paris: 1877, 8vo, 115 pp.).

South and East Africa. General notes on its marine *Gastropoda*, pointing out the differences between the fauna of the Cape and the tropical parts, by J. S. GIBBONS, Q. J. Conch. No. 12, pp. 233-237.

2 Cephalopods, 72 marine Gastropods, and 27 marine Bivalves found at the Papuan Islands, 2, 32, and 10 at the Moluccas respectively, enumerated by C. TAPPARONE CANEFRI, Ann. Mus. Genov. ix. pp. 278-300.

5. *Pacific.*

W. DALL discusses the marine faunal regions of the Pacific, distinguishing them as follows:—(1) Province Oregon, from Monterey to the Shumagin Islands; (2) Aleutian Province, including the whole Aleutian group, to depths of 500 fathoms; (3) Arctic Province, on the surface as far as drift ice is to be found during the winter, and depths of more than 500 fathoms. P. Ac. Philad. 1876, p. 205, and Scientific Results of the Exploration of Alaska, vol. i. No. 1, p. 1; abstract by Kobelt, Nachr. mal. Ges. 1877, pp. 33-35.

Behring Straits. H. CROSSE gives a list of its *Mollusca*, containing 2 species of *Cephalopoda*, 70 *Gastropoda*, and 44 Bivalves, taken chiefly from English and North American publications; J. de Conch. xxv. pp. 101-128.

North-west America. New species of *Muricidae*, *Buccinidae*, and one *Pandora*; DALL, P. Cal. Ac. 1877.

California. 160 marine species from Santa Rosa Island enumerated by YATES, Q. J. Conch. No. 10, pp. 182-185.

Japan. 32 new marine shells by W. DUNKER, Mal. Bl. xxiv. pp. 67-75.

Galapagos. 19 species of marine shells collected by Commodore Cookson at Charles Island, enumerated by E. A. SMITH, P. Z. S. 1877, pp. 69-71, most of them identical with species living on the western coasts of the continent of America; two are new. Extract in Nachr. mal. Ges. 1877, p. 90.

Polynesia. Catalogue vi. of the Museum Godeffroy at Hamburg (published by J. Schmeltz), gives (pp. 79-98) exact localities for a large number of sea-shells.

New Caledonia. New species by D. SOUVERBIE, J. de Conch. xxv. pp. 71-76.

6. *Australian and Antarctic Seas.*

New South Wales. 45 new marine species by G. F. ANGAS, P. Z. S. 1877, pp. 34–40, pl. v., and pp. 171–177, pl. xxvi. A list of 2 Cephalopods, 9 Pteropods, 136 Gastropods, and 37 Bivalves, found at Port Jackson and the adjacent coasts of New South Wales; *id.* l. c. pp. 178–193.

Some notes on marine shells found on the coast of South Australia; *id.* Q. J. Conch. No. 10, pp. 178 & 179.

Tasmania. 4 species of Cephalopods, 394 of marine Gastropods, and 136 of marine Bivalves, enumerated by J. E. TENISON-WOODS, P. R. Soc. Tasm. 1877, pp. 3–34.

Amsterdam and St. Paul Islands. 1 Cephalopod, 41 Gastropods, and 11 Bivalves described by C. VÉLAIN, most of them new, even five new genera of small size. *Ranella proditor* (Frauenf.) the only shell of rather large size. Two species of *Fissurella* identical with South African species, *Lasæa rubra* (Mont.) even European [see, however, below, in the special part]. No *Mytilus*, no *Litorina*. Arch. Z. expér. vi. pp. 98–144, pls. ii.–v. Preliminary notes, containing the names, but not the descriptions, of most of the new genera and species, in C. R. lxxxiii. pp. 284–287; abstract in J. de Conch. xxv. pp. 296–298.

Kerguelen. 35 species of marine *Mollusca* enumerated, and most of them described, by E. A. SMITH, Tr. Venus Exp. Moll. 26 pp., 9 pls. [*anted.* p. 6, note]; among them, 10 are identical with, and 8 more nearly allied to, Magellanic species. The hitherto known shells of Kerguelen Island are again enumerated from the papers of KIDDER and SMITH by Crosse, J. de Conch. xxv. pp. 1–15. [We may mention that the Berlin Museum has some species collected by the German Expedition, which are not contained in either list.]

Palæontology of recent Species.

The fossil *Clausilia* are the subject of an elaborate treatise by O. BOETTGER, Clausilien-Studien, 1877 (4). He points out that the oldest forms agree more with the recent *Balea*, and want the clausilium, e.g., sect. *Triptychia*, without lunella and with continuous spiral lamella. The clausilium was at first emarginate, as in the recent *Marpessa* and *Alopiæ*, then S-shaped, and finally rounded. Among the 40 subgenera admitted or established by him, one is only known from eocene, five others from miocene strata; the rest are living, but *Dilataria*, *Phædusa* (including *Oospira*, at present limited to Eastern Asia), *Serrulina*, and *Lamini-fera* are also represented in the miocene of Europe by distinct species. *Marpessa*, *Alinda*, and *Pirostoma*, containing the British and Middle-European species, are represented only in the pleistocene, and by identical, not distinct, species.

On shells from diluvial beds near Berlin, chiefly *Paludina diluviana* (Kunth) and *Valvata naticina* (Menke); REINHARDT, SB. nat. Fr. 1877, pp. 171–174.

Helix ichthyomma. On its sub-fossil occurrence in Thuringia; MARTENS, JB. mal. Ges. iv. pp. 229 & 230.

S. CLESSIN has examined the land and freshwater shells deposited in the pleistocene and alluvial beds in Bavaria; compared with those which are still living in the same countries, he comes to the following conclusions:—In the valley of the Danube, during the pleistocene period, the climate was cold and wet. The then living species of land snails are chiefly those now widely spread in Europe; a few others, then living in the plains of Bavaria, have retired to the Alps or are totally extinct. At the time of the alluvial deposits, the climate was remarkably warmer, but also very wet, and several species, then living in many parts of Southern Germany, such as *Zonites verticillus* and *Helix austriaca*, have since retired to the south-eastern part of Europe; very few (5) species represented in the alluvial beds are now extinct. Several others, now known only from few and somewhat isolated localities, as *Helix rudrata*, *Clavus filigrana*, &c., were formerly more generally spread, their distribution having been more continuous. OB. Ver. Regensb. 1877 (separate copy, 75 pp.).

Land shells from diluvial beds (Loess) in Hungaria, all recent species, collected by Prof. E. Beyrich, determined by MARTENS, SB. nat. Fr. 1877, pp. 213 & 214.

R. TURNOUR has published notes on the shells of the quarternary tufa at La Celle, near Moret, dep. Seine-et-Marne. Among 33 land-shells, 21 are identical with species still living in the same country; some others, as *Helix bidens* (Chemn.) and *Zonites acies* (Müllid.), survive only in other parts of Europe; others are quite extinct. *Helix pomatia* and *aspersa*, at present very abundant in that country, are not represented. Bull. Soc. Géol. (3) 1874; J. de Conch. xxv. pp. 306 & 307.

Scrobicularia piperata (Gm.), sub-fossil in mud, near Greifswald; FRIEDEL, Nachr. mal. Ges. 1877, pp. 82 & 83. [It is also found living in the western part of the Baltic, but rarely.]

MONTEROSATO has published a paper on the post-pliocene, or what has been called glacial, shells of Monte Pellegrino and Ficarazzi, near Palermo, many of which are identical with species still living in the Mediterranean; Bollettino del Regio Comitato Geologico (Roma: 1877), Nos. 1 & 2. G. BRUGNONE gives several critical observations and additions to it, discussing 36 species of them which are still living in the Mediterranean, 6 of which are living in the Atlantic or northern seas, but not in the Mediterranean, and 12 which are quite extinct, so far as known; Bull. Soc. mal. Ital. iii. pp. 17–46, pl. i.

S. BRUSINA contradicts the identification of several fossil species from the miocene beds near Vienna with recent Mediterranean species, as admitted by Hörnes, and gives new names to the fossils; J. de Conch. xxv. pp. 368–378.

G. SEGUENZA has described and figured the tertiary *Nuculidae* of Southern Italy, 58 species, 16 still living; 4 of the latter appear in the miocene, the rest in the pliocene strata. Atti Acc. Rom. (3) i. 1876–77, pp. 1163–1200, 5 pls.

M. DE CESSAC has examined the shells of certain limestone layers in

the Cape Verde Islands, covered by basalt, and already indicated by Darwin. The marine species are still living in the neighbouring sea, except one (*Cerithium emulum*); among the land-shells are two extinct species. C. R. 1874, Feb.; J. de Conch. xxv. pp. 301 & 302.

Acclimatization.

A list of 20 species of terrestrial Mollusks acclimatized in foreign countries is given by P. STROBEL, Atti Soc. Ital. xix. (1876) p. 42.

Helix pisana acclimatized at Swansea and in Guernsey; R. RIMMER, Q. J. Conch. No. 13, pp. 266 & 267.

Helix terrestris (Chemn.) [*elegans*, Drap.] found in North America; MAZYCK, P. Ac. Philad. 1876, p. 127.

Planorbis dilatatus (Gould) acclimatized at Pendleton. Q. J. Conch. 1877; Nachr. mal. Ges. 1877, p. 10.

Use by Man.

Olivella biplicata, or "Colcol," figs. 62 & 63, fragments of *Haliotis rufescens*, or "Abalone," fig. 64, and of *Pachydesma crassatelloides*, or "Hawock," fig. 65, used as shell-money or ornaments by the aborigines of North America, described and figured by R. E. C. STEARNS, Am. Nat. xi. pp. 344-348, pl. ii. (separate). The same author, l. c. p. 250, gives a table of aboriginal shell-money used on the west and east coasts of North America, and in the Indo-Pacific and African regions. E. A. BARBER, tom. cit. pp. 270-272, describes beads cut by aborigines from *Oliva* (*biplicata*?), pl. i. fig. 7, *Busycon* or *Murex*, fig. 58, *Marginella*, *Fasciolaria*, and other genera, usually univalves. STEARNS, l. c. pp. 473 & 474, refers the *Oliva* to *O. gracilis* or *O. dama*, and states that if it were *biplicata*, a communication with tribes north of Lower California would have to be inferred; and if the ornaments were from *Busycon*, a communication with the Gulf of Mexico would be implied, from the known distribution of those shells.

Dentalium, *Haliotis*, *Olivella biplicata*, and discoidal pieces of *Saxidomus aratus*, are or were employed as money by the natives in California; L. G. YATES, Am. Nat. xi. pp. 30-32, figs. 2 & 3, and Q. J. Conch. No. 11, p. 221.

Questions of Nomenclature.

Some observations concerning "species" and "variety": SHERIFF-TYE, Q. J. Conch. No. 10, pp. 171-174; C. P. GLOYNE, l. c. pp. 175-178.

Objections to the re-introduction of pre-Lamarckian names for priority's sake; A. SUTOR, JB. mal. Ges. iv. pp. 150-156.

CEPHALOPODA.

H. v. IHERING, Vergl. Anat. Nervensyst. Moll., describes specially the nervous system of *Sepia officinalis*, and comes to the conclusion that the funnel alone is the homologue of the foot in the *Gastropoda*, being supplied from the same nerve-ganglion, and that the arms belong really to the head, and are to be compared with the conical appendages of the head of some *Pteropoda*; the brachial ganglion, which gives origin to the nerves of the arms, being a detached portion of the cerebral ganglion. He describes also the sympathetic nerves of *Nautilus*, not hitherto known.

G. PFEFFER notes the existence of a nerval commissure between the two ganglia stellata in *Octopus* and *Eledone*, which has been denied by other naturalists; Z. wiss. Zool. xxviii. pp. 203 & 204.

Architeuthis princeps (Verrill). A specimen of this gigantic squid, cast ashore after a severe gale at Catalina, Trinity Bay, Newfoundland, September 24th, was found still living. The length of the body 9.5 feet from tip of tail to base of arms, circumference 7 feet, length of the tentacular arms 30 feet, length of the upper mandible 5.25 inches, diameter of a great sucker 1 inch. A. E. Verrill, Am. J. Sci. (3) xiv. p. 425; abstract in "Kosmos," ii. p. 483.

Architeuthis mouchezi, sp. n., Vélain, Arch. Z. expér. vi. p. 1, St. Paul Island.

Sepia brachychira, sp. n., C. Tapparone Canefri, Ann. Mus. Genov. ix. p. 278, Sorong Island, near New Guinea.

Nautilus pompilius (L.) does not live in deep water; Bennett, Ann. N. H. (4) xx. pp. 331-334.

First whorls of the shell and the scar on its blunt tip described by J. Barrande, "Céphalopodes du système silurien de la Bohême," vol. ii. pt. 5, pp. 42-62, pl. cccclxxxix. figs. 10, 1-7.

PTEROPODA.

H. v. IHERING contradicts the views of Huxley, Gegenbaur, and Grenacher as to the morphological homologies of some organs, from his researches into the nervous system; according to him, the conical processes at the head of *Clio*, named by him "*cephaloconi*," are neither tentacles nor parts of the foot. The wings are morphologically lateral parts of the foot, for which he proposes the name "*pteropodia*," being supplied by the same ganglion as the middle part of the foot.

Hyalea (19 species), *Cleodora* (4), *Balantium* (4), *Triptera* (1), *Cresis* (6), and *Spirialis* (8), figured by Sowerby, in Reeve's Conch. Icon., parts 336 & 337, *Pteropoda*, 6 plates; *Hyalea cumingi* (Desh. MS.), fig. 5, *obtusa*, fig. 8, *minuta*, fig. 9, *intermedia*, fig. 10, and *Cleodora lobata*, fig. 26, Atlantic Ocean, are apparently new.

Limacina helicoides, sp. n., Jeffreys, Ann. N. H. (4) xix. p. 338, Northern Atlantic.

Clio borealis (Pall.) described from specimens found at Disco har-

bour, Greenland, and Waigat Street; Jeffreys, Ann. N. H. (4) xix. p. 338. Abundant in the White Sea; Wagner, Z. wiss. Zool. xxviii. p. 385.

Larva of a gymnosomatous Pteropod, from the South Pacific, lat. 37°, described by Moseley, Q. J. Micr. Sci. (2) xvii. pp. 32–34, pl. iii. figs. 14–16.

HETEROPODA.

Atlanta, 3 species, figured by Sowerby in Reeve's Conch. Icon., parts 336 & 337, *Pteropoda*, figs. 20, 21, & 42.

Cirropteron semilunare (Sars), found at Naples and described by G. G. Grillo, Bull. Soc. mal. Ital. iii. pp. 54–57, pl. ii. figs. 1–5 [probably the larval stage of a Gastropod].

Sinusigera (Orb.): 2 species figured by Sowerby in Reeve's Conch. Icon. parts 336 & 337, *Pteropoda*, figs. 43 & 44 [also very probably larvæ of Gastropods].

GASTROPODA.

PECTINIBRANCHIA.

MURICIDÆ AND PURPURIDÆ.

Murex. The known species enumerated by W. Kobelt, JB. mal. Ges. iv. pp. 141–161 & 238–252.

Murex brazieri, Angus, P. Z. S. 1877, p. 171, pl. xxvi. fig. 1, Port Jackson; *M. duthiersi* and *hermanni*, Vélain, Arch. Z. expér. vi. pp. 98 & 99, pl. ii. figs. 1–4, St. Paul and Amsterdam Islands: spp. nn.

Typhis. The known species enumerated by Kobelt, JB. mal. Ges. iv. pp. 287–289.

Trophon clathratus (L.). Description of the living animal, with synonymy and new localities of it, and of *T. fabricii* (Beck); Jeffreys, Ann. N. H. (4) xix. pp. 325 & 326.

Trophon muriciformis, Dall, P. Cal. Ac. 1877, sep. print p. 4, Behring Sea and Icy Cape; *T. tritonidea*, Vélain, Arch. Z. expér. vi. p. 101, pl. ii. figs. 6 & 7, St. Paul Island: spp. nn.

Trophon albo-labratum (Smith, 1875); E. A. Smith, Transit Venus Exp. Moll., p. 4, pl. ix. fig. 2, Kerguelen Island [antea, p. 6, note].

Vitularia (Swains.). The known species enumerated by W. Kobelt, JB. mal. Ges. iv. pp. 252 & 253.

Purpura patula (L.) and *callaoensis* (Gray). Varieties from the Galapagos Islands; E. A. Smith, P. Z. S. 1877, p. 69.

Purpura (*Cronia*) *anomala*, Angus, P. Z. S. 1877, p. 34, pl. v. fig. 1, Port Jackson Heads, 29 fathoms; *P. dumasi* and *magellani*, Vélain, Arch. Z. expér. vi. pp. 102–104, pl. ii. figs. 8–11 & 12, St. Paul and Amsterdam Islands: spp. nn.

Rhizochilus (*Coralliophila*) *parvus*, sp. n., E. A. Smith, P. Z. S. 1877, p. 70, Galapagos.

Magilina, g. n. Near *Magilus*; of small size, not included in corals, but fixed by its flattened base to marine bodies; first whorl glossy, red, somewhat compressed. Animal not known. *M. serpuliformis*, sp. n., Vélain, C. R. lxxxiii. p. 285; Arch. Z. expér. vi. p. 105, pl. ii. figs. 16 & 17, St. Paul and Amsterdam Islands. [May perhaps belong to the *Vermetide*.]

BUCCINIDÆ.

Chrysodomus crebricostatus[-a], Unalaska, 100 fathoms, *brunneus*, Nunivak Island, Behring Sea, *virens*, Kyska Harbour, and *roseus*, Arctic Ocean, spp. nn., Dall, P. Cal. Ac. 1877, separate print pp. 1 & 2.

Fusus berniciensis (King), *ebur* (Mörch) = *mæbii* (Dunk. & Metz.) and *sabini* (Gray) = *togatus* (Mörch), found off Norway at 80–500 fathoms; Friele, N. Mag. Naturv. xxiii. [1876], and JB. mal. Ges. iv. pp. 161 & 162.

Fusus mohni, Friele, and *turgidulus*, Jeffreys & Friele, N. Mag. Naturv. xxiii. and l. c. p. 262, Northern Norway, 1120 and 290–400 fathoms; spp. nn.

Fusus islandicus, Lovén, = *berniciensis* (King); *islandicus*, Gould, = *stimpsoni* (Mörch) = *curtus* (Jeffr.); *ebur*, Kobelt, nec Mörch, *mæbii*, (Dunker) = *togatus* (Mörch); *breviculus* is from Kamtschatka. Mörch, J. de Conch. xxv. pp. 268–270, and Nachr. mal. Ges. 1877, p. 58.

Fusus attenuatus (Jeffr., 1870), shell described, *berniciensis* (King), var. n., *elegans*, and var. n. *inflata*, *sabini* (Gray), living animal described, new localities for all three; Jeffreys, Ann. N. H. (4) xix. pp. 326 & 327.

Fusus tortuosus (Reeve) ?, Hayes Sound and Dobbin Bay, Grinnell Land, 79° N. lat.; E. A. Smith, Ann. N. H. (4) xx. p. 132.

Fusus jeffreysianus (Fischer), in the Mediterranean, often found in the stomach of *Trigla*; Crosse & Fischer, J. de Conch. xxv. p. 99.

Fusus: the known Californian species critically enumerated. *F. (Chrysodomus) dirus* (Rve.) = *sitchensis* (Midd.), *ambustus* (Gould) = *tumens* (Casp.), *luteo-pictus*, new name for *ambustus*, Carpenter & Cooper, and *kobelti*, sp. n.; Dall, P. Cal. Ac. 1877, March.

Volutopsis callorhinus [callirrh-], sp. n., id. l. c. p. 2, St. Paul Island, Behring Sea.

Thatcheria, g. n.; shell angularly pyriform, solid, spire prominent, shorter than the aperture, many-whorled, whorls flattened above, strongly keeled at the periphery and contracted below; aperture with a broad incurved sinus between the extremity of the last keel and the junction of the body-whorl; basal canal wide and open; columella smooth; outer lip simple below the sinus. *T. mirabilis*, sp. n. (3 inches), Japan; Angas, P. Z. S. 1877, p. 529, pl. liv. fig. 1.

Fusionella recurvirostris, sp. n., Marrat, Q. J. Conch. No. 10, p. 180, Cape Blanco, W. Africa.

Pusio kossmanni, sp. n., Pagenstecher, in Kossmann's Zool. Ergebnisse, i. pt. 2, p. 53, fig. 27, Red Sea, founded on an imperfect young shell.

Buccinum. Epidermis very variable in the same species; Mörch, J. de Conch. xxv. p. 287.

Buccinum undatum (L.). The microscopical structure of its egg-cases

treated by W. v. Nathusius, *Untersuch. nichtcellul. Organismen*, pp. 28-32, pl. i. figs. 5-9, pl. ii. figs. 10-14.

Buccinum marchi, sp. n., Friele, *N. Mag. Naturv.* xxxiii. [1876]; *JB. mal. Ges.* iv. p. 260, Northern Norway, 400 fathoms.

Buccinum greenlandicum (Chemn.) and *tenu* (Gray). Descriptions of living animal, the same and *ciliatum* (Fabr.), synonymy and new localities; Jeffreys, *Ann. N. H.* (4) xix. pp. 323 & 324.

Buccinum belcheri (Rv.), var., with woodcut of shell and radula, *hydrophanum* (Hanc.) and *sericatum* (Hanc.), Dobbin Bay, 79° N. lat.; E. A. Smith, *Ann. N. H.* (4) xix. pp. 133 & 134.

Buccinum castaneum, Shumagin Islands, *tricarinatum*, perhaps variety of the preceding, Western Aleutians, *picturatum*, Aleutian Islands, *fringillum*[-a], near ~~Hy~~ Cape, spp. nn., Dall, *P. Cal. Ac.* 1877, sep. print, pp. 3 & 4.

Neobuccinum, g. n.; shell like that of *Buccinopsis*, operculum with lateral nucleus, central and lateral teeth of the radula tricuspidate. *N. eatoni* (Smith, 1875, as *Buccinopsis*). E. A. Smith, *Transit Venus Exp.*, *Moll.* p. 3, pl. ix. fig. 1, Kerguelen Island [*anted.* p. 6, note].

Liomesus nux, sp. n. (P = *crassa*, Nyst, var.), Aleutian Islands; Dall, *l. c.* p. 2.

Truncaria australis, sp. n., Angas, *P. Z. S.* 1877, p. 174, pl. xxvi. fig. 5, Port Jackson.

Hindsia (A. Ad.). The known species enumerated; Kobelt, *JB. mal. Ges.* iv. pp. 296 & 297.

Cyllene (Gray). The known species enumerated; *id. l. c.* pp. 297-299.

Canidia (H. Ad.) and *Clea* (A. Ad.). The known species enumerated; *id. l. c.* pp. 299 & 300.

NASSIDÆ.

Eburna. The known species enumerated; Kobelt, *l. c.* pp. 294 & 295.

Bullia. The known species enumerated, with notes on their geographical distribution; *id. l. c.* pp. 289-294.

Bullia (*Liodomus*) *kurrachensis*, Angas, *P. Z. S.* 1877, p. 529, pl. liv. fig. 6, Kurrachi, Scinde; *B. mozambicensis*, E. A. Smith, *tom. cit.* p. 719, pl. lxxv. fig. 18, Quellimane: spp. nn.

Nassa smithi, sp. n., Marrat, *Q. J. Conch. No.* 11, p. 204, locality unknown.

OLIVIDÆ.

Oliva. H. C. Weinkauff continues his monograph of this genus in the new edition of Chemnitz, pts. (256) 261 & 262, pp. 41-120, Nos. 18-91, pls. x.-xxxiii. *O. rufo-picta*, sp. n., p. 88, pl. xxii. figs. 11 & 12, Japan.

Olivella brazieri, sp. n., Angas, *P. Z. S.* 1877, p. 172, pl. xxvi. fig. 6, New South Wales.

Harpa. A. Sutor treats this genus monographically, admitting the following 14 species: *ventricosa*, Lam., *costata* (L.) = *imperialis* (Küster, Reeve), *articularis* (Lam.), *nablium* (Martini), the young of

which is *striatula* (A. Ad.), *ligata* (Menke), *conoidalis* (Lam.), *crenata* (Swains.), *rosea* (Lam.), *nobilis* (Lam.), *minor* (Lam.), *crassa* (Phil.) = *solidula* (A. Ad.), *gracilis* (Brod.), *striata* (Lam.), and *cabriti* (Bernard); *cancellata* (Chemn.) and *virginalis* (Gray) remain doubtful. JB. mal. Ges. iv. pp. 97-129, pls. 4 & 5, representing *costata*, *articularis*, *nablium*, *ligata*, *striata*, and *cabriti*.

FASCIOLARIIDÆ.

Peristernia brazieri, sp. n., Angas, P. Z. S. 1877, p. 171, pl. xxvi. fig. 4, New South Wales.

MITRIDÆ.

Mitra turturina (Souv., 1875), Souverbie, J. de Conch. xxv. p. 73, pl. i. fig. 2, New Caledonia.

Mitra hanleyana, sp. n., Dunker, Mal. Bl. xxiv. p. 70, Japan.

VOLUTIDÆ.

Voluta. The known species enumerated and arranged in 16 subgenera; Kobelt, JB. mal. Ges. iv. pp. 301-312.

Volutolyria, subg. n., Crosse & Fischer, J. de Conch. xxv. pp. 97-99, for *Voluta musica*, L., of which the operculum is described by M. E. Marie, *ibid.*

Microvoluta, g. n.; allied to *Voluta*, but no deep siphonal notch and no toothed projection of the base of the pillar; shell smooth, shining, apex papillary, columella with 4 strong transverse plaits, &c. For *M. australis*, sp. n. (5 lines long), Port Jackson Heads, 25 fathoms. Angas, P. Z. S. 1877, pp. 34 & 35, pl. v. fig. 2.

COLUMBELLIDÆ.

Strombina torquemi, sp. n., Joussemaume, Bull. Soc. Zool. Fr. 1877, p. 265, pl. v. figs. 1 & 2, locality unknown.

Pyrene eustomus, sp. n., *id.* l. c. p. 266, pl. v. figs. 3 & 4, locality unknown.

Columbella (*Mitrella*) *filicineta*, p. 279, *C. (Atilia) doliolium*, and *C. (Strombina) callosiuscula*, p. 280, *C. (S.) albertisi*, p. 281, C. Tapparone Canefri, Ann. Mus. Genov. ix., Sorong Island, near New Guinea; *C. (Anachis) speciosa* and *smithi*, Angas, P. Z. S. 1877, p. 35, pl. v. fig. 3, and p. 172, pl. xxvi. fig. 7, Port Jackson; and *C. (A.) cuspidata*, Marrat, Q. J. Conch. No. 12, p. 242, Western Africa: spp. nn.

Amycla burchardti, sp. n., Dunker, Mal. Bl. xxiv. p. 67, Japan.

MARGINELLIDÆ.

Marginella. Some analogous African and West Indian species mentioned by Marrat, Q. J. Conch. No. 10, p. 179.

Marginella (*Glabella*) *davisiana*, sp. n., *id.* l. c. No. 11, p. 205, W. Africa.

Marginella celata, Monterosato, J. de Conch. xxv. p. 44, pl. ii. fig. 3, Algiers; *M. strangii* and *metcalfei*, Angas, P. Z. S. 1877, pp. 172 & 173, pl. xxvi. figs. 8 & 9, Port Jackson: spp. nn.

Marginella (Persicula) polyodonta, *glandina*, and *crossii*, spp. nn., Vélain, Arch. Z. expér. vi. pp. 108 & 109, pl. iii. figs. 1-6, St. Paul and Amsterdam Islands, the first between compound Ascidians.

Serrata caledonica, sp. n., Jousseaume, Bull. Soc. Zool. Fr. 1877, p. 267, pl. v. figs. 8-10, New Caledonia.

Volvarina bowvieri, sp. n., *id. l. c.* p. 268, pl. v. figs. 5-7, Cape Verde Islands.

Marginella (Gibberula) nana and *lucida*, spp. nn., Marrat, Q. J. Conch. No. 11, p. 205, locality unknown.

Gibberula lucia, sp. n., Jousseaume, *l. c.* p. 269, pl. v. figs. 11-13, Cape Verde Islands.

CONIDÆ.

Conus marmoreus (L.) bites dangerously; Montrouzier, J. de Conch. xxv. p. 99.

Conus (Stephanoconus) smithi, sp. n., Angas, P. Z. S. 1877, p. 36, pl. v. fig. 8, Botany Bay.

Conus metcalfei, *id. l. c.* p. 173, pl. xxvi. fig. 13, Port Jackson; *C. lamberti*, Souverbie, J. de Conch. xxv. p. 71, pl. i. fig. 1, & pl. ii. fig. 7, New Caledonia; *C. brevis*, *croceus*, *inconstans*, and *fusco-maculatus*, localities unknown, and *propinquus*, new name for *tenuisulcatus* (Souv., 1873, pre-occupied), E. Smith, Ann. N. H. (4) xix. pp. 222-224; *C. cuneiformis*, *id. Q. J. Conch. No. 11*, p. 202, with woodcut, locality unknown: spp. nn.

Conus spiroglozus (Desh.) = *generalis* (L.), juv.; Paulucci, J. de Conch. xxv. pp. 274 & 275.

PLEUROTOMIDÆ.

Pleurotoma (s. str.) and *Clavatula* (Lam.). The known species enumerated and their habitats indicated; H. C. Weinkauff, JB. mal. Ges. iv. pp. 1-43.

Pleurotoma amicta and *albo-fasciata*, Sandwich Islands, *nelliæ*, Mauritius, *ceylonica*, Ceylon, *acutigemmata* and *retusispirata*, locality unknown, *cognata*, Australia, *antipodum* and *zealandica*, New Zealand, *multiseriata*, Ceylon and Persian Gulf, spp. nn., E. Smith, Ann. N. H. (4) xix. pp. 188-492.

Pleurotoma (Drillia) chocolatatum, Japan, *subochracea*, *mindanensis*, *latissimata*, *nodilirata*, *angusta*, *intertincta*, all China Sea or Philippine Islands, *concolor*, Moluccas, *incerta*, New Guinea, *multilirata*, Port Jackson, *digna*, California, and *rotundicostata*, *variabilis*, *atkinsoni*, *consociata*, *pratii*, *excavata*, localities unknown, *id. l. c.* pp. 492-499; *P. (D.) rosolina*, *gracilis*, and *filosa*, Marrat, Q. J. Conch. No. 12, pp. 238 & 239, Western Africa: spp. nn.

Drillia æmula, sp. n., Angas, P. Z. S. 1877, p. 36, pl. v. fig. 9, New South Wales.

Pleurotoma (*Clionella*) *borni*, *krausi*, *bipartita*, *subventricosa*, and *platystoma*, spp. nn., E. Smith, Ann. N. H. (4) xix. pp. 499-501, South Africa.

Mangelia jacksonensis and *flavescens*, spp. nn., Angas, P. Z. S. 1877, p. 37, pl. v. figs. 10 & 11, Port Jackson.

Clathurella brenchleyi, *rufo-sonata*, *pustulata*, and *modesta*, spp. nn., id. l. c. pp. 37 & 38, pl. v. figs. 12-15, Port Stephens and Port Jackson.

Pleurotoma (*Defrancia*) *concinna* (Scacchi) = *scabra* (Jeffreys), distinct from *linearis* (Mont.), Algiers and Naples, Monterosato, J. de Conch. xxv. p. 43, pl. ii. fig. 1. *P. stosiciana* (Brusina), id. l. c. p. 43, Algiers.

Pleurotoma (*Bela*) *ovalis* and *willii*, spp. nn., Friele, N. Mag. Naturv. xxiii. [1876] and JB. mal. Ges. iv. p. 263, Northern Norway, 400-1180 fathoms.

[*Bela*] *Pleurotoma pyramidalis* (Ström), *bicarinata* (Couth.) = *granlandica* (Reeve), *pingeli* (Möller) and *elegans* (Möller), living animals described, the same and *decussata* (Couth.), *tenuicostata* (Sars), *declivis* (Lövén), *turricula* (Mont.), sculpture variable, *exarata* (Möller), and *trevelyana* (Turt.), synonymy and new localities, *declivis* var. n. *angustior*, and *trevelyana* var. n. *smithi*, Northern seas, Jeffreys, Ann. N. H. (4) xix. pp. 328-332. *P. (B.) violacea* (Migh.), Discovery Bay, 81° N. lat., E. Smith, Ann. N. H. (4) xx. p. 132.

Lachesis turqueti, sp. n., Vélain, Arch. Z. expér. vi. p. 107, pl. ii, figs. 18 & 19, St. Paul Island, South Indian Sea.

TEREBRIDÆ.

Terebra lischkeana and *lebbeckana*, spp. nn., Dunker, Mal. Bl. xxiv. p. 74, Japan.

Terebra tricineta, *persica*, and *pellii*, spp. nn., Persian Gulf, *grayi*, new name for *gracilis* (Gray, nec Reeve), locality unknown, *melanacme*, *bathyrhaphæ*, and *albo-sonata* (E. Smith, 1875), Japan; E. Smith, Ann. N. H. (4) xix. pp. 224-227.

Terebra (*Myurella*) *fuscobasis*, *fusco-cincta*, *macandrewi*, and *cognata*, spp. nn., id. l. c. pp. 227-229, Persian Gulf.

Terebra (*Hastula*) *rufo-punctata*, sp. n., locality unknown, *confusa*, new name for *cinerea* (Hinds, nec Born), = *aciculina*, pt., Reeve, figs. 121 D-F, and synonymy of *cinerea* (Born) = *aciculina* (Lam., nec Reeve); id. l. c. pp. 229-231.

Terebra (*Impages*) *cœrulescens* (Lam.) = *nimbosa* (Hinds); id. l. c. p. 230.

CANCELLARIIDÆ.

Cancellaria viridula (Fab.). Synonymy, description of living animal, and new localities; the genus *Admete* rejected for it, the apex being, however, peculiarly sculptured; Jeffreys, Ann. N. H. (4) xix. p. 322.

Admete ? *limnæiformis* [limnæif-], sp. n., Smith, Transit Venus Exp., Moll., p. 6, pl. ix. fig. 4, Kerguelen Island [anteda, p. 6].

CERITHIOPSIDÆ.

Cerithiopsis scabrella, Tapparone-Canefri, Ann. Mus. Genov. ix. p. 282, New Guinea; *C. purpurea*, Angas, P. Z. S. 1877, p. 36, pl. v. fig. 7, Port Jackson: spp. nn.

CASSIDIDÆ AND RANELLIDÆ.

Dolium perdis (L.) *occidentalis* from the West Indies, *Helix sulfurea* being the larval shell of it; Mörch, Mal. Bl. xxiv. pp. 42 & 43.

Dolium antillarum, sp. n., *id. l. c.* p. 41, Jamaica and St. Croix.

Pyrula fortior, new name for *reticulata* (Lam., nec Linck); Mörch, Mal. Bl. xxiv. p. 43.

Tritonium. Several species common to the East and West Indies; *id.* Nachr. mal. Ges. 1877, pp. 58 & 59.

Buccinatorium (Petiver) proposed as subgeneric name for the typical species of *Triton* (Lam.); *id.* Mal. Bl. xxiv. p. 26.

Triton testaceum [-us] (Mörch, 1852) = *obscurus* (Rv.), *T. costatum* (Born), var. *americanum* (Orb.), *aquatile* (Rv.), *rubecula* (L.), *thersites* (Rv.), *gracile* (Rv.); West Indian varieties enumerated by Mörch, Mal. Bl. xxiv. pp. 25-30. *T. krebsi*, sp. n., *id. l. c.* p. 30, St. Thomas and St. Croix, West Indies. *T. (Linatella) poulsenii*, sp. n., *id. l. c.*, p. 33, Curaçao. *T. (L.) rostratum* (Martini) = *caudatum* (Gmel.); *id. ibid.*

Ranella. List of Polynesian species with distinct localities; Schmeltz, Nachr. mal. Ges. 1877, pp. 81 & 82. *R. proditor* (Frauenf.), from St. Paul and Amsterdam Islands; Vélain, Arch. Z. expér. vi. p. 100, pl. ii. fig. 5.

Aspella, subg. n. of *Ranella*: type, *R. anceps* (Lam.); Mörch, Mal. Bl. xxiv. p. 24.

CYPREIDÆ.

Cypræa. H. C. Weinkauff begins a monograph of this genus in the new edition of Chemnitz, pt. 261, pp. 1-16, Nos. 1-15.

Erythræa (Tournefort), subgeneric name for *Cypræa cervus*, *exanthema*, &c.; Mörch, Mal. Bl. xxiv. p. 45.

OVULIDÆ.

Ovula carolinensis, sp. n., Mörch, Mal. Bl. xxiv. p. 54, South Carolina.

Volva adamsi and *carpenteri*, spp. nn., Dunker, Mal. Bl. xxiv. p. 75, Japan.

PEDICULARIIDÆ.

Pedicularia sicula (Swains.) found on *Oculina* at the Hydros Islands; Bavy, J. de Conch. xxv. p. 228.

NATICIDÆ.

Cochlis (Bolten), new subgeneric name for a section of *Natica*, the operculum of which is shelly and provided with a marginal furrow, as

N. pennata (Schröter, 1788) = *cayennensis* (Recl.), *limacina* (Jousseaume), *ruflabris* (Rv.), *proxima* (C. B. Ad.), *lacernula* (Orb.), and *sagraiana* (Orb.): the last four shortly described; Mörch, Mal. Bl. xxiv. pp. 63 & 64.

Natica affinis (Gmel.). Description of living animal, synonymy, and new localities, with varr. *occlusa* (S. Wood) and *vittata*; Jeffreys, Ann. N. H. (4) xix. pp. 318 & 319. From Dobbin Bay, 79° N. lat., with synonymy; E. Smith, Ann. N. H. (4) xx. p. 138.

Natica antoni (Phil.), from Quellimane; E. Smith, P. Z. S. 1877, p. 720.

Natica caffra and *N. (Mamma) faba*, Marrat, Q. J. Conch. No. 11, pp. 204 & 205, W. Africa; *N. obliquata*, id. l. c. No. 12, p. 243, W. Africa: spp. nn.

Neverita reiniana, sp. n., Dunker, Mal. Bl. xxiv. p. 71, Japan.

VELUTINIDÆ.

Velutina (Morvillia) zonata (Gould), var. n. *grandis*, Franklin-Pierce Bay, 79° N. lat.; E. Smith, Ann. N. H. (4) xx. p. 137.

Vanikoro vitrinæformis [vitrinif.] and *oxychone*, spp. nn., Mörch, Mal. Bl. xxiv. p. 93, W. Indies.

Pilidium radiatum (Sars, 1850, as *Capulus*) = *P. commodum* (Middend., 1851) = *Capulacmæa radiatum* (Sars, 1858) = *Piliscus commodum* (Lovén, 1859), &c. Living animal and new varieties; Jeffreys, Ann. N. H. (4) xix. p. 321.

Allerya, subg. n. of *Piliscus* (Lovén) = *Pilidium* (Midd.) = *Capulacmæa* (Sars). Shell asymmetrical, broader and more arcuate on the right, summit at the hinder part, somewhat to the left; a subcoriaceous epidermis; muscular impression in shape of a horse-shoe, very narrow, rounded at both ends. *P. (Allerya) gussoni* (Costa, as *Ancylus*), Mediterranean, and *krebsi*, sp. n., St. Thomas, W. Indies. Mörch, J. de Conch. xxv. pp. 209-211; also Mal. Bl. xxiv. p. 100.

Scutulum, g. n., for *Patella gussoni* (Costa); Monterosato, Ann. Mus. Genov. ix. p. 427 [see the preceding].

MARSENIIDÆ.

Onchidiopsis granlandica (Bergh), Franklin-Pierce Bay, 79° N. lat., E. Smith, Ann. N. H. (4) xx. p. 140.

TRICHOTROPIDÆ.

Trichotropis tenuis, sp. n., Grinnel Land, 79° N. lat., 25 fathoms, and *borealis* (Brod.), Dumb-bell Harbour, 82° N. lat., with some corrections concerning Reeve's monograph of this genus; E. Smith, Ann. N. H. (4) xx. pp. 135-137, with a woodcut of the new species.

STRUTHIOLARIIDÆ.

Struthiolaria crenulata (Lam.). Paulucci, Bull. Soc. mal. Ital. iii. pp. 49-53, has examined Lamarck's original specimen, and states it to be a

peculiar species, distinct from and intermediate between *S. vermis* (Martyn) = *australis* (Gmel.) and *S. papulosa* (Martyn) = *nodulosa* (Leach). It is also figured by Spengler, in the "Naturforscher," pt. vii. (1782), without specific name.

Struthiolaria mirabilis (Smith, 1875); E. Smith, Transit Venus Exp. Moll. p. 4, pl. ix. fig. 3, Kerguelen [*antea*, p. 6].

STROMBIDÆ.

Strombus raninus (Gmel.) = *lobatus* (Swains., Sow.), Mörch, Mal. Bl. xxiv. p. 19, W. Indies. *S. gigas* (L.) and *goliath* (Chemn.): on the older synonymy of these and other W. Indian species; *id. l. c.* pp. 14-17.

Gladus martinii, sp. n., Marrat, Q. J. Conch. No. 12, p. 245, pl. i., Cebu, Philippines.

CERITHIIDÆ.

Vertagus pfeifferi, sp. n., Dunker, Mal. Bl. xxiv. p. 75, Japan.

Cerithium procerum [preoccupied by Kiener in *Vertagus*], Jeffreys, Ann. N. H. (4) xix. p. 322, N. of Scotland, 1450 fathoms; *C. danielsenii*, Friele, N. Mag. Naturv. xxiii., and JB. mal. Ges. iv. p. 259, Northern Norway, 400-1150 fathoms; *C. isseli* (Descr. de l'Egypte, pl. iv. fig. 1), Pagenstecher, in Kossmann's Zool. Ergebn. ii. p. 44, Red Sea; *C. kobeltii*, Dunker, Mal. Bl. xxiv. p. 67, Japan: spp. nn.

Fastigiella poulsoni, sp. n., Mörch, J. de Conch. xxv. p. 207; the systematic place of this genus is near *Triforis*.

Lampania aterrima, sp. n., Dunker, Mal. Bl. xxiv. p. 70, Japan

Bittium turritelliformis [-e], sp. n., Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 14, Port Jackson.

Monophorus, subg. n. of *Triforis*, for *T. perversus* (L.), Grillo, Description de quelques espèces, &c., p. 15; larval form of it observed by the same, Bull. Soc. mal. Ital. iii. pp. 57-60, pl. ii. fig. 6. *T. grayi* (Hinds) = *perversus*; *id. ibid.*

Triforis isleanus, sp. n., Vélain, Arch. Z. expér. vi. p. 112, pl. iii. fig. 10, St. Paul and Amsterdam Islands.

Triphoris (Mastonia) lusorius and *lineolatus*, and *T. (M.?) minutissimus*, spp. nn., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 283, New Guinea.

Planaxis. Monograph by Sowerby in Reeve's Conch. Icon. parts 234 & 235, 236 & 237, 5 plates, 38 species and figures; *P. strigatus* (Hanley MS.), fig. 25, Pacific, is apparently new.

TURRITELLIDÆ.

Turritella crosa (Couth.) and *reticulata* (Mighels). Description of living animal, synonymy, and new localities; Jeffreys, Ann. N. H. (4) xix. pp. 239 & 240.

Turritella turbona, sp. n., Monterosato, Ann. Mus. Genov. ix. p. 420, woodcut, near Civita Vecchia.

Torcula parva, sp. n., Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 17, Port Jackson.

MELANIIDEÆ.

Melania. A. BROT continues his valuable monograph of this genus in the new edition of Chemnitz, parts 259 & 264, pp. 193-352, Nos. 200-347, pls. xxv.-xxxiv. He treats of the following subgenera: *Striatella* (n.), p. 193, Nos. 200-271, *M. petiti* (Phil.), *luctuosa* (Hinds), *samoensis* (Reeve), *tuberculata* (Müll.), &c., *Plotia* (Bolten), p. 263, Nos. 272-292, *M. oulanensis* (Pease), *terpsichore* (Gould), *scabra* (Müll.); *Plotiopsis* (n.), p. 284, Nos. 293-296; *M. lamberti* (Crosse), *balonensis* (Cour.), *spinulosa* (Lam.); *Tiara* (Bolten), p. 288, Nos. 289, type *amarula* (L.); *Tiaropsis* (n.), p. 299, Nos. 309-312, type *winteri* (Phil.); *Tarebia* (H. & A.), p. 311, Nos. 318-341, *M. impura* (Lea), *celebensis* (Q. G.), *lirata* (Bens); *Sermyla* (H. & A. Ad.), p. 329, Nos. 342-346, *M. tornatella* (Lea), *riqueti* (Grat.), &c. Further additions, pp. 335-341. The following are new, or not before figured: *M. waigiensis* (Less.), p. 195, pl. xxii. fig. 6, *disjuncta*, sp. n., p. 198, pl. xxii. fig. 11, Borneo?, *landaueri*, sp. n., p. 199, pl. xxii. fig. 12, Aru Islands, *nevillei*, sp. n., p. 200, pl. xxii. fig. 13, Andaman Islands?, *subexusta* (Mouss.), p. 204, pl. xxiii. fig. 2, Samoa Islands, *societatis* (Mouss.), p. 208, pl. xxiii. fig. 5, Tahite, *gracilina* (Gould), p. 218, pl. xxiv. fig. 6, Tahite, *graffii* (Mouss.), p. 221, pl. xxiv. fig. 10, Viti Islands, *futunensis* (Mouss.), p. 226, pl. xxiv. fig. 11, Futuna Island, Pacific, *pluviatilis* (Mouss.), p. 232, pl. xxiv. fig. 12, Friendly Islands, *assavensis* (Mouss.), p. 229, pl. xxv. fig. 2, Kanathia Island, Viti group, *denisonensis*, sp. n., p. 234, pl. xxv. fig. 6, Port Denison, Queensland, *malayana* (Issel, as var.), sp. n., p. 253, pl. xxvi. fig. 5, Borneo, *parreyssi*, sp. n., p. 254, pl. xxvii. fig. 3, Java, *victoriae* (Dohrn), p. 257, pl. xxvi. fig. 2, Zambesi river, *nodicincta* (Dohrn), p. 259, pl. xxvii. fig. 6, Lake Nyassa, *turritelloides* (Mouss.), p. 265, pl. xxvii. fig. 16, Viti Islands, *M. rudicostis* (Mouss. MS.), p. 280, pl. xxviii. fig. 7, Amboina, *setigera* (Brot.), p. 298, pl. xxx. fig. 7, Philippines, *dimidiata* (Menke), p. 303, pl. xxxi. fig. 9, *derelecta*, sp. n., p. 313, pl. xxxii. fig. 12, and *procera*, sp. n., p. 319, pl. xxxiii. fig. 5, localities unknown, *invicta* (Mouss. MS.), p. 318, pl. xxxiii. fig. 12, Philippines, *spectabilis*, sp. n., = *lateritia*, var. (Reeve), p. 321, pl. xxxiii. fig. 15, locality unknown, *onca* (A. Ad. & Angas), p. 329, pl. xxxiv. fig. 7, N. E. Australia, *venustula*, sp. n., p. 331, pl. xxxiv. fig. 5, Port Denison, Australia, *larvata*, sp. n., p. 336, pl. xxxiv. fig. 11, Tehuantepec, *reiniana*, sp. n., p. 337, pl. xxxiv. fig. 14, Japan, *niponica* (E. Smith), p. 338, pl. xxxiv. fig. 10, Japan, *heros*, sp. n., p. 339, pl. xxxiv. fig. 1, locality unknown, *recentissima* (Tapparone-Canevari), p. 340, pl. xxxiv. fig. 3, Aru Islands.

Melania turritispira, *pupiformis*, *simonsi*, *polymorpha*, and *nyassana*, spp. nn., and *nodicincta* (Dohrn), Lake Nyassa; E. Smith, P. Z. S. 1877, pp. 713-715, pl. lxxv. figs. 1-15.

Melania libertina (Gould) = *tenuisulcata* (Dunker) = *ambidextra* (Martens) = *japonica* (Reeve). On its varieties found in Japan; Martens, SB. nat. Fr. 1877, pp. 114-116.

Melania laevigata (Lam.), from Timor, *id.* MB. Ak. Berl. 1877, p. 281, pl. i. figs. 17 & 19. *M. mæsta* (Hinds), from New Ireland, *id.* l. c. p. 282, pl. i. figs. 15 & 16.

Melania singularis, sp. n., Tapparone-Canevari, Ann. Mus. Genov. ix. p. 284, New Guinea.

Doryssa (H. & A. Ad.), treated as a distinct genus by A. Brot in his monograph, new edition of Chemnitz, part 264, pp. 342-352, pl. xxxv. 11 species. *D. hohenackeri* (Phil.), p. 349, pl. xxxv. fig. 6, not before figured. *D. devians*, sp. n., p. 352, pl. xxxv. fig. 10, Surinam.

Paludomus andersoniana, sp. n., Mandalay, Bharno, &c., and var. ? sp. n., *peguensis* (= *regulata*. Bens., var.), Pegu, *P. burmanica*, sp. n., Yaylaymaw and Mandalay, *blanfordiana*, sp. n. (= *labiosa*, of the "Conchologia Indica," pl. cviii. fig. 9, *nec* Benson), Pegu and Ava; G. Nevill, J. A. S. B. xlv. part 2, pp. 35-37.

LITTORINIDÆ.

Littorina setosa (Smith, 1875), E. Smith, Transit Venus Exp. Moll., p. 6, pl. ix. fig. 4, Kerguelen Island [*anted*, p. 6].

Lacuna parvula and *hiberti*, spp. nn., Vélain, Arch. Z. expér. vi. p. 113, pl. iii. fig. 11-13, St. Paul Island.

Fossarus: (a) s. str. *costatus*, Brocchi, *ambiguus* (L.), and *granatum* (Brugn.); (b) *Megalomphalus* (Brusina): *azonus* (Brusina) = *petitianus* (Tiberi), *depressus* (Seguenza), and *monterosati* (Grillo) = *excavatus* (Monterosato, *nec* C. B. Ad.); Grillo, Descr. quelq. esp. nouv. pp. 14 & 15, and Monterosato, J. de Conch. xxv. pp. 31-33. *F. fischeri*, sp. n., Mörch, Mal. Bl. xxiv. p. 96, St. Thomas, West Indies.

RISSELLIDÆ.

Rissoella (*Jeffreysia*) *sancti-pauli*, sp. n., Vélain, Arch. Z. expér. vi. p. 116, pl. iii. fig. 20, St. Paul Island, South Indian Sea.

RISSOIDÆ.

Rissoa. Sowerby continues his monograph, including *Rissoina* and *Assimineæ*, in Reeve's Conch. Icon. parts 232 & 233, from pl. x. sp. and fig. 86 to pl. xiii. fig. 123. *R. bureana*, new name for *Rissoina concinna* (A. Ad. 1854), fig. 90, *flexuosa* (Gould, as *Rissoina*), fig. 97, North America, *australis*, sp. n., fig. 123, Australia.

Rissoa arenaria (Mighels & Ad.), *castanea* (Möller), and *globulus* (Möller), Arctic Seas; descriptions of the living animals by Jeffreys, Ann. N. H. (4) xix. pp. 238 & 239.

Rissoa kergueleni (Smith, 1875), E. Smith, Transit Venus Exp. Moll., p. 10, pl. ix. fig. 12, Kerguelen Island [*anted*, p. 6].

Rissoa wyville-thomsoni, Jeffreys & Friele, N. Mag. Naturv. xxiii. [1876], and JB. mal. Ges. iv. p. 259, Northern Norway, 500 fathoms; *R. lenti*, *casini*, and *subtruncata*, Vélain, Arch. Z. expér. vi. pp. 114 & 115, pl. iii. figs. 14-17, St. Paul Island; *R. papuana*, Tapparone-Canevari, Ann. Mus. Genov. ix. p. 285, New Guinea: spp. nn.

Rissoa (Alvania) sororcula, sp. n., with var. *asperella*, Grillo, Descr. quelq. esp. nouv. p. 11, Messina, near *dictyophora* (Phil.).

Alvania elegans and *gracilis*, spp. nn., Angas, P. Z. S. 1877, p. 174, pl. xxvi. figs. 15 & 16, Port Jackson.

Ceratia variegata, sp. n., Tapparone-Canefri, l. c. p. 285, New Guinea.

Eatoniella kerguelensis, *caliginosa*, and *subrufescens* (Smith, 1875, as *Eatonia*); E. Smith, Transit Venus Exp., *Moll.*, pp. 8 & 9, pl. ix. figs. 9-11, Kerguelen Island [*antea*, p. 6].

Skenea subcanaliculata (id. 1875); id. l. c. p. 9, pl. ix. fig. 15, Kerguelen Island.

Rissoina. H. O. Weinkauff begins a monograph of this genus in the new edition of Chemnitz, pts. 262 & 265, pp. 1-16, thirteen species, plate not yet published.

Rissoina hystrix and *scolopax*, spp. nn., Souverbie, J. de Conch. xxv. pp. 74 & 75, pl. i. figs. 3 & 4, New Caledonia.

Rissoina stricta (Menke) from the Galapagos; E. Smith, P. Z. S. 1877, p. 71.

Scalenostoma appendiculatum (Souv., 1876); Souverbie, J. de Conch. xxv. pp. 77 & 274, pl. i. fig. 5, Mauritius.

[*Hydrobia*] *Paludestrina* (Orb.). J. Mabilie, R. Z. (3) v. p. 214, distinguishes three subgenera:—

1. *Eupaludestrina*, of conical shape, mostly with a cover of dirt, living on the coasts of the sea, British Channel, and Atlantic.
2. *Thalassobia* (n.), of very elongate shape, glossy, living on the shores of the Mediterranean; type, *acuta* (Mich.) [Drap. ?].
3. *Pseudopaludinella* (n.), of ovoid, obtuse shape, and very small size, living in brackish water on or near the coast of the Atlantic and Mediterranean.

[*Hydrobia*] *Paludestrina mabilii*, *saint-simoniana*, *milne-edwardsi*, *eucyphogyra*, *acutulis*, *sancti-coulbani*, all from the shores of Northern France, *moitessieri*, *spiroxia*, *aciculina*, *gracillima*, and *soluta*, Mediterranean shores of France, *paludinelliformis*, Arcachon, *arenarum*, *narbonensis*, and *leneumicra*, salines of Narbonne, *brevispira*, Antibes, spp. nn., Bourguignat, Spec. novissim. Moll. 1876. The six former belong to the subgenus *Eupaludestrina*, the five following to *Thalassobia*, the five last to *Pseudopaludinella*; Mabilie, l. c.

Paludestrina (*Eupal.*) *lhospitali*, *bourguignati*, *acuminata*, *oblonga*, *peringiiformis*, and *inquinata*, northern coasts of France, Mabilie, l. c. pp. 215-220; *P. (Thalassobia) euryomphala*, id. l. c. p. 222, Southern France: spp. nn.

Peringia (*Palad.*) [Zool. Rec. xi. p. 144]. The known French and Algerian species are* enumerated and the following new added by Mabilie, R. Z. (3) v. pp. 300-348:—*Peringia letourneuxi*, Rennes, in brackish water, far from the sea, *perrieriana*, Gironde, *micropleurus*, Arcachon, *microstoma*, Gironde, *pyramidalis* and *mabilii* [?], Corsica, *cyclo-labris*, *tumida*, and *reboudi*, Oran, Bourguignat, Spec. novissim. Moll. 1876; *P. enhalia*, Calvados, *fagotiana*, Villefranche, *deyrolliana*, Côtes du Nord, *bourguignati*, L'Orient and Morbihan, *obesa* and *maritima*, Gironde, *cyrniaca*, Corsica, and *excentrica*, Oran, Mabilie, l. c. pp. 302-314: spp. nn.

Hydrobia caspia, *spicu*, and *dimidiata* (Eichw.), living in the Caspian

Sea, at considerable depths; Grimm, Kasp. more fauna, ii. pp. 79-81 (radula of the two latter, pl. vii. figs. 6 & 7).

Paludestrina duperrei, sp. n., Vélain, Arch. Z. expér. vi. p. 115, pl. iii. figs. 18 & 19, St. Paul Island.

Hydrobia pumila, sp. n., and *caliginosa* (Gould, as *Littorina*); E. Smith, Transit Venus Exp. Moll. p. 7, pl. ix. figs. 7 & 8, Kerguelen [anted., p. 6].

Bythinella columna, sp. n., Clessin, JB. mal. Ges. iv. p. 355, Karfreit, Austrian coast.

Paludinella gilesi, sp. n., Angas, P. Z. S. 1877, p. 170, pl. xxvi. fig. 2, shores of Lake Eyre, Southern Australia.

Benedictia (Dybowski, 1875) has some points of resemblance to *Lio-placodes* (Meek, 1864); W. Dall, P. Bost. Soc. xix. [1876] p. 44.

Tryonia (Stimps.). Dall, l. c. pp. 45 & 46, expatiates on the systematic value of the genera and subgenera proposed by Dybowski for species from Lake Baikal [Zool. Rec. xiii. Moll. p. 31]; he thinks that they are to be united with the genus *Tryonia*, and proposes for some of them the following subgenera:—

Baikalia (Martens, emend.), margin of the aperture notched anteriorly in the adult: *Ligea carinata* (Dybowski).

Liobaikalia (Martens, emend.), whorls loosely coiled: *Leucosia stiedæ* (Dybowski).

Dybowskia, subg. n.; whorls transversely ribbed with a ciliate epidermis, deep suture, short and rapidly tapering spire, and sub-circular aperture: *Ligea ciliata* (Dybowski) and *L. duhiersi* (Dyb.), if distinct.

Lithoglyphus caspius (Krynicky), living in the Caspian Sea, in depths from 105 to 280 feet; Grimm, l. c. ii. p. 82 (radula, pl. ix. fig. 8).

PALUDINIDÆ.

Paludina. The European species discussed, *P. mamillata* (Küst.), *atra* (Cristof. and Jan.), *costæ* (Heldreich), and *okaensis* (Clessin), being regarded as distinct species; Kobelt, Iconogr. v. pp. 73-76, pls. cxxxviii.-cxl. figs. 1379-1382.

Paludina chinensis (Gray) = *lecythoides* (Bens.), with var. *P. ampulliformis* (Souleyet), from Burmah and Yunnan, and var. *P. lecythis* (Bens.), from Sylhet; *P. bengalensis* (Lam.), with the var. *P. gigantea* (Rv.), *doliaris* (Gould), *polygramma* (Martens), *cingulata* (Martens) = *cochin-chinensis* (Morelet) = *obscurata* (Desh.) = *ingallsiana* (Reeve, nec Lea) = *frauenfeldi* (Morelet); *naticoides* (Theob.) = *shanensis* (Theob.); *crassa* (Hutt.), with new var. *tezpurenensis*; *dissimilis* (Müll.) = *remossi* (Phil.) = *præmorsa* (Reeve), with the var. *obtusa* (Troschel), *variata* (Frauenf.) = *carinata* (Rv., nec Swains.), *ceylonica* (Dohrn), *heliciformis* (Frauenf.), *viridis* (Rv.), and *decussatula* (Blanf.), all from British India: G. Nevill, Cat. moll. Mus. Calcutta, i. pp. 24-41.

Paludina jeffreysi, *capillata*, and *robertsoni* (Frauenfeld), from Lake Nyassa; E. Smith, P. Z. S. 1877, pp. 716 & 717, pl. lxxiv. figs. 1-6.

Tylotoma. Various notes concerning this genus; Wetherby, Q. J. Conch. No. 11, pp. 207-215.

Bythinia inflata (Hansen) and *majewskii* (Parr.), Siberia, lat. 60° and 56° N.; Westerlund, Sv. Ak. Haudl. (2) xiv. No. 12, pp. 63-65.

Bythinia stanleyi, E. Smith, P. Z. S. 1877, p. 717, pl. lxxv. figs. 21 & 22, Lake Nyassa; *B. moreletiana*, Nevill, J. A. S. B. xlv. pt. 2, p. 29, Yay-laymay: spp. nn.

Larina (A. Ad.), operculum very thin, concentrically ribbed, radula unknown, lives in brackish water. *L. cincta*, sp. n., Pooree. *Paludina granum* (Menke) also belongs to this genus. G. Nevill, Cat. moll. Mus. Calcutta, pp. 21 & 22.

Margarya, g. n. Spire produced, *Melania*-like, composed of scalariform, rapidly increasing whorls, with very distinct suture; apex obtuse; sculptured with prominent spiral ribs; rimate (or umbilicate?); margins of aperture rounded, not continuous; animal and operculum unknown. *M. melanioides*, sp. n., Lake Tali, in Yunnan. Nevill, J. A. S. B. xlv. pt. 2, p. 30.

VALVATIDÆ.

Valvata lacustris, sp. n., = *V. obtusa* var. (Brot), Clessin, Mal. Bl. xxiv. p. 177, Lake of Geneva, in depths of 50 to 100 mètres.

Valvata nitens, sp. n., and *sibirica* (Midd., as var. of *cristata*), Siberia, at the Yenissei, lat. 63° and 68° N., Westerlund, Sv. Ak. Handl. (2) xiv. No. 12, pp. 62 & 63, pl. i. figs. 15 & 16.

Valvata japonica, sp. n., Martens, SB. nat. Fr. 1877, pp. 116, Lake Hakone, Japan.

Valvata ? microscopia, sp. n., G. Nevill, Cat. moll. Mus. Calcutta, p. 21, Port Canning.

AMPULLARIIDÆ.

Ampullaria globosa (Swains.), with var. *B. A. corrugata* (Swains.), var. *C. A. carinata* (Swains.) = *malabarica* (Phil.) = *luyardi* (Rv.) = *paludinoides* (Phil.), var. *D. incrassatula*, and var. *E. minor*, Cis-gangetic India, Ceylon, and Assam; *A. maura* (Rv.), Assam, var. *A. theobaldi* (Hanl.), Bhamo; *A. aperta* (Phil.) = *saxea* (Rv.), Pegu, Akyab, Cachar; *A. conica* (Gray) = *scutata* (Mouss.) = *compacta* (Rv.) = *orientalis* (Phil.), Trans-gangetic India; *A. stoliczkanæ*, sp. n., Pulo Pinang; G. Nevill, Cat. moll. Mus. Calcutta, pp. 1-11.

Lamistes solidus and *affinis*, spp. nn., and *nyassanus* (Dohrn), Lake Nyassa, E. Smith, P. Z. S. 1877, pp. 715 & 716, pl. lxxiv. figs. 7-11.

VERMETIDÆ.

Vermetus cristatus (Biondi, 1859) = ? *granulatus* (Forbes), Algiers; Monterosato, J. de Conch. xxv. p. 36.

Vermetus varians (Orb.), *electrinus* (Mörch), and *conicus* (Dillw.). On their synonyms and varieties; Mörch, Mal. Bl. xxiv. pp. 116-121, West Indies.

Siphonium nebulosum (Dillw.). Synonyms and varieties; Mörch, Mal. Bl. xxiv. pp. 112-114, West Indies.

Thylacodes riisii (Mörch, 1860), with two varietics, and *brasiliensis* (Roussseau); Mörch, l. c. pp. 121-123, West Indies.

Spirogllyphus annulatus (Daud.). On its synonyms, varietics, and oporculum, *id.* l. c. pp. 114-116, West Indies.

Vermicularia spirata (Phil.). Several varieties described; *id.* l. c. pp. 111 & 113, West Indies.

[*Siliquaria*] *Tenagodus ruber* (Schumacher), *squamatus* (Blainv.), and *Pyxipoma anguille* (Mörch, 1860), characterized; *id.* l. c. pp. 109 & 110, West Indies.

CÆCIDÆ.

Parastrophia. Folin maintains that it is a distinct genus, not the young state of *Cæcum* [as Monterosato suspected: see Zool. Rec. xiii. Moll. p. 32], and figures for this purpose the nucleus of *Cæcum*, *Mioceras*, *Strebloceras*, and *Parastrophia*; J. de Conch. xxv. pp. 203-207, pl. v.

CAPULIDÆ.

Capulus elegans, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 286, New Guinea.

Capulus shreevii (Conrad) is the internal projection of the hinge of a *Pholas*; Fischer, J. de Conch. xxv. p. 57.

Amathina angustata (Souverbie, 1875), J. de Conch. xxv. p. 72, pl. i. fig. 6, New Caledonia.

Krebsia, new subgeneric name for *Hipponyx militaris* (L.); Mörch, Mal. Bl. xxiv. p. 97, West Indies.

SOLARIIDÆ.

Tiberi's notes on the Mediterranean species [*cf.* Zool. Rec. xii. p. 168, and xiii. Moll. p. 33] are published in Bull. mal. v. [1872] pp. 31-43; he enumerates as species still living in the Mediterranean Sea: *Solarium*, s. str. *S. perspectiviforme*, new name for *pseudo-perspectivum* (Brocchi), *discus* (Phil.), *moniliferum* (Bronn); subg. *Philippia* (Gray): *S. conulus* (Weink.) and *simplex* (Bronn); subg. *Torinia* (Gray): *S. fallaciosum* (Tiberi). Also *Gyriseus jeffreysianus* (Tiberi), [*H*] *Omalaxis zancleus* (Philippi, as *Bifrontia*).

Solarium trisulcatum, sp. n., Jousseau, Bull. Soc. Zool. Fr. 1877, p. 270, pl. v. figs. 14 & 15, New Caledonia.

Sequenzia formosa and *carinata* (Jeffer., 1876), description and localities; Jeffreys, Ann. N. H. (4) xix. p. 319 & 320.

SCALARIDÆ.

Scalaria candidissima, sp. n., Monterosato, J. de Conch. xxv. p. 37, pl. ii. fig. 5, Algiers, with notes on some other species of the Mediterranean.

Acirsa (Mörch) considered as generically distinct on account of the peristome not being continuous and apex of the spire blunt; it includes

Scalaria eschrichti (Holb.), *S. subdecussata* (Cantr.), and *A. prelonga*, sp. n., Jeffreys, Ann. N. H. (4) xix. p. 241.

PYRAMIDELLIDÆ.

Obeliscus jucundus, sp. n., Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 10, Port Jackson.

Oscilla ligata, sp. n., *id. l. c.* p. 173, pl. xxvi. fig. 11, Botany Bay.

Odostomia gigantea, sp. n., Dunker, Mal. Bl. xxiv. p. 71, Japan.

Odostomia internodalis (S. Wood), found in the recent state at Algiers; Monterosato, J. de Conch. xxv. p. 39, pl. iii. fig. 1.

Odostomia albula (Fab., as *Turbo*) = *Menestho albula* (Möllers), distinct from *Pyramis striatula* (Couth.), and living animal described; Jeffreys, Ann. N. H. (4) xix. p. 252. There is no reason to separate it from *Odostomia*.

Chemnitzia pusilla (Philippi) was not rightly interpreted by Jeffreys or Hörnes, it is a recent species nearly allied to *lactea* (L.), and quite distinct from the fossil *C. terebellum* (Phil.), which belongs to the subdivision *Pyrgulina*; Brugnone, Bull. Soc. mal. Ital. ii. 1876, pp. 211-215, pl. c, figs. 1 & 2.

Turbonilla (Chemnitzia) scalaris [preoccupied], *disculus*, and *peroni*, spp. nn., Vélain, Arch. Z. expér. vi. pp. 110 & 111, pl. iii. figs. 7-9, St. Paul Island, South Indian Sea.

Turbonilla festiva, sp. n., Angas, P. Z. S. 1877, p. 35, pl. v. fig. 4, Port Jackson.

Cingulina brazieri, sp. n. *id. ibid.* fig. 5, Port Jackson.

Apicalia guntheri, sp. n., *id. ibid.* fig. 6, New South Wales.

Auriculina monterosati and *messanensis*, spp. nn., Grillo, Descr. quelq. esp. nouv. pp. 12 & 13, Messina.

Myonia sinuata, sp. n., Angas, *l. c.* p. 39, pl. v. fig. 18, Port Jackson. The author thinks that this genus belongs rather to the *Tornatellidæ*.

EULIMIDÆ.

Eulima stalioides (Brusina), Algiers; Crosse, J. de Conch. xxv. p. 70, pl. iii. fig. 3.

Eulima stenostoma (Jeffer.), new localities; Jeffreys, Ann. N. H. (4) xix. p. 317.

STYLIFERIDÆ.

Stylifer brazieri, sp. n., Angas, P. Z. S. 1877, p. 173, pl. xxvi. fig. 12, Port Jackson, on a starfish.

SCOUTIBRANCHIA.

H. FRIELE (Arch. Math. og Naturvid. 1877) has described the radula of many Norwegian species belonging to this order (*Rhipidoglossa* of Troschel), and among them a new genus, which by the small number of lateral teeth comes remarkably near to the *Tenidoglossa*. Only those the

radula of which has not before been described and figured by Lovén, will be mentioned *infra*.

NERITIDÆ.

Nerita polita (L.) [*marginata* (Gmelin)] and *rumphii* (Recl.), varieties in the Red Sea; Pagenstecher, in Kossmann's Zool. Ergebnisse, i. pt. 2, p. 59, figs. 28-30 & 31-34.

Neritina. E. v. Martens continues his monograph of this genus in the new edition of Chemnitz, part 266, pp. 65-144, Nos. 31-79, pls. x.-xiv. He treats the subgenus *Neritæa*, group *aculeata*, p. 70, *N. aculeata* (Chemn.), group *semicirculata*, p. 72, *N. latissima* (Brod.), *punctulata* (Lam.), *jordani* (Sow.), &c.; group *pictæ* (Menke) or *serrata* (Recl.), p. 93, *N. gagates* (Lam.), *turrita* (Chemn.), *communis* (Q. G.), *virginea* (L.), &c.; group *venosa*, p. 130, *N. pupa* (L.), *reticulata* (Sow.), &c.; finally, the subgenus *Neritodryas* (Martens), p. 136, *N. dubia* (Chemn.), *cornea* (L.), &c. A synoptic table indicating the chief peculiarities of the species is given at the beginning of each group or subgenus. No new species. Peculiar attention is given to the geographical distribution and local occurrence (marine, for example, in *N. virginea*, *pupa*, *reticulata*; amphibious in *N. cornea* and *dubia*).

Neritina comorensis, sp. n., Morelet, J. de Conch. xxv. p. 345, pl. xiii. fig. 6, Anjoana, Comoro Islands.

Neritina thermophila, sp. n., New Britain, in hot springs on the seashore, and *souleyetana* (Recl.), var. n. *studeriana*, New Ireland, E. v. Martens, MB. Ak. Berl. 1877, p. 284, pl. i. figs. 12 & 13.

Neritina schultzei, sp. n., Grimm, Kasp. more fauna, ii. p. 77, pl. viii. fig. 16, shell, and pl. vii. fig. 5, radula, Caspian Sea, 280-326 feet. *N. liturata* (Eichw.), radula, *id. ibid.* p. 76, pl. vii. fig. 2.

[*Smaragdia* ?] *Neritina* (*Theodoxus*) *viridissima*, sp. n., Tapparone-Canefti, Ann. Mus. Genov. ix. p. 287, Sorong Island, N.W. of New Guinea [very near *N. rangiana*, Recluz].

TROCHIDÆ.

Phasianella muniere and *brevis*, spp. nn., Vélain, Arch. Z. expér. vi. pp. 116 & 117, pl. iv. figs. 1-3, St. Paul Island, South Indian Sea.

Turbo exquiritus, sp. n., Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 18, Botany Bay.

Turbo chemnitzianus (Reeve) in the Red Sea; Pagenstecher, l. c. p. 57.

Trochus (*Omphalius*) *cooksoni*, sp. n., E. Smith, P. Z. S. 1877, p. 71, pl. xi. fig. 7, Galapagos Islands.

Ziziphinus occidentalis (Bock), radula; Fricke, l. c.

Oxysteles depressa, sp. n., Messina, depth of 65 mètres, and *O. rometensis* (Seguenza, 1873, *Turbo*, pliocene), Algiers, 207 fathoms, both described by J. Grillo, Descript. d. quelq. esp. nouv. pp. 5-9. Animal and operculum unknown [therefore the generic determination uncertain.]

Trochus (*Gibbula*) *drepanensis* (Brugnone) found at Algiers; Monterosato, J. de Conch. xxv. p. 31, pl. ii. fig. 6.

Korenia, subg. n., for *Trochus cinerarius* (L.), *tumidus* (Mont.), and *millegranus* (Forbes), on account of the radula; Friele, *l. c.*

[*Margarita*] *Trochus cinereus* (Couth.), *umbilicalis* (Brod.), *olivaceus* (Brown) = *argentatus* (Gould), and *vahlî* (Möller), synonymy, new localities, living animal of the first three; Jeffreys, Ann. N. H. (4) xix. pp. 236-238. *T. (M.) umbilicalis* (Brod.) and *glauca* (Möller), Franklin-Pierce Bay, 79° N. lat., E. Smith, Ann. N. H. (4) xx. pp. 138 & 139. Radula of *Margarita helicina* (Fabr.), *grœnlandica* (Beck), and *olivacea* (Brown); Friele, *l. c.*

Trochus (Margarita) benoiti, new name for *Delphinula* ? *elegantula* (Philippi), found in the recent state at Messina; Grillo, Descr. esp. nouv. p. 15.

Margarita lacazii with var. *nigricans*, sp. n., Vélain, Arch. Z. expér. vi. p. 118, pl. iv. figs. 4-6, St. Paul and Amsterdam Islands.

Trochus (Photinula) expansus (Sow.) from Kerguelen Island; E. Smith, Transit Venus Exp. Moll. p. 11 [*antea*, p. 6].

Machæroplax, g. n., with only 5-10 lateral teeth in the radula; for *Margarita affinis* (Jeffr.), *varicosa* (Mighels), *bella* (Verkrûzen), *obscura* (Couth.), and *albula* (Gould). Friele, *l. c.*

Malleria costulata (Möller). Peristome continuous, operculum shelly, living animal described from the Arctic Sea; Jeffreys, Ann. N. H. (4) xix. p. 235. Radula; Friele, *l. c.*

Umbonium adamsi, sp. n., Dunker, Mal. Bl. xxiv. p. 74, Japan.

Ethalia brazieri, sp. n., Angas, P. Z. S. 1877, p. 39, pl. v. fig. 17, Port Jackson.

Cyclostrema basicarinatum and *trochoides*; radula, Friele, *l. c.*

Cyclostrema peterseni, Friele, N. Mag. Naturv. xxiii. [1876], and JB. mal. Ges. iv. p. 259, Northern Norway, 150 & 484 fathoms; *C. basistriatum*, Jeffreys, Ann. N. H. (4) xix. p. 234, Northern seas, in different depths, from 50-1095 fathoms. *C. catenoides*, Monterosato, Ann. Mus. Genov. ix. p. 417, woodcut, Civita Vecchia, Palermo, &c.: spp. nn.

Merchia (A. Ad.). General note on the genus, *M. moreleti* (pl. iv. fig. 1) and *biplicata*, spp. nn., Fischer, J. de Conch. xxv. pp. 200 & 201, China.

Cirsonella, g. n.; shell minute, globosely turbinate, smooth, narrowly umbilicated; aperture circular, peristome continuous, slightly thickened. Differs from *Crossea*, A. Ad., in the absence of the basal tooth. Previously placed in the *Trochidæ*. For *C. australis*, sp. n., Botany Bay. Angas, P. Z. S. 1877, p. 38, pl. v. fig. 16.

Circulus striatus (Phil., as *Valvata*); on its synonymy and varieties, Monterosato, J. de Conch. xxv. p. 30.

Stomatia pallida, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 238, New Guinea.

HALIOTIDÆ.

Pleurotomaria beyrichi, sp. n., Hilgendorf, SB. nat. Fr. 1877, pp. 72 & 73, from collections made in Japan, third recent species of this genus, measuring 83 millimètres in diameter and 82 in height.

Scissurella crispata (Flem.), radula, Friole, *l. c.* ; living animal described by Jeffreys, Ann. N. H. (4) xix. p. 233. *S. angulata* (Lovén) and *aspera* (Phil.) are only varieties of this species; *id. ibid.*

Schizotrochus, new subgenus for *Scissurella crispata*, on account of its trochoid form; Monterosato, Ann. Mus. Genov. ix. p. 416.

Scissurella tenuis, sp. n., Jeffreys, *l. c.* p. 234, Greenland, 1450 fathoms.

Scissurella supra-plicata (Smith, 1875), E. Smith, Transit Venus Exp. *Moll.* p. 10, pl. ix. fig. 5, Kerguelen Island [*anteà*, p. 6].

Schismope mouchezi, sp. n., Vélain, Arch. Z. expér. vi. p. 119, pl. iv. figs. 7 & 8, St. Paul Island.

Haliotis exigua, sp. n., Dunker, Mal. Bl. xxiv. p. 69, Japan.

FISSURELLIDÆ.

Puncturella noachina (L.), radula; Friele, *l. c.*

Puncturella profundæ, sp. n., Jeffreys, Ann. N. H. (4) xix. p. 232, Greenland, 1450 fathoms, and coast of Portugal 740–1095 fathoms.

Lucapina pfeifferi, sp. n., Dunker, Mal. Bl. xxiv. p. 70, Japan.

CYCLOBRANCHIA.

ACMÆIDÆ.

Erginus, g. n., proposed for *Tectura rubella* (Fabr.), and the living animal described; Jeffreys, Ann. N. H. (4) xix. p. 231.

PATELLIDÆ.

Dall's paper on the *Patellidæ* [see Zool. Rec. xiii. *Moll.* p. 35] is also contained in his "Scientific Results of the Exploration of Alaska," vol. i.

Patella (*Patinella*) *kerguelensis*, sp. n., *ænea* (Gm.), *fuegiensis* (Reeve), and (*Nacella*) *mytilina* (Gm.), all from Kerguelen Island, E. Smith, Transit Venus Exp. *Moll.* pp. 11–16, the first and third pl. ix. figs. 13 & 14 [*anteà*, p. 6].

Propilidium ancyloide (Forbes) = *Rostrispira parva* (Seguenza), new localities; Jeffreys, Ann. N. H. (4) xix. p. 232.

Lepeta cæca (Müll.), living animal described. Apex in the young spiral, incurved, deciduous, new localities and geographical distribution; *id. l. c.* pp. 231 & 232. From Franklin-Pierce Bay, 79° N. lat.; E. Smith, *op. cit.* xx. p. 139.

Scutulum and *Allerya* [*anteà*, under *Velutinidæ*].

CHITONIDÆ.

The nervous system of *Chiton* is specially described by H. v. IHERING in his work "Vergleichende Anatomie des Nervensystems der Mollusken," and some notes concerning it, the two pallial nerves uniting at the hinder

part above the intestine, not below, as in the Bivalves, are given by him in *Morphol. JB.* iii. pp. 155-178, pl. x.

W. DALL has observed the exactly median situation of the vent and 1-3 pairs of ovarian orifices or fenestræ in *Stimpsoniella emersoni* (Couth.), *Tonicella marmorea* (Fabr.), *Trachydermum album* (L.), and *rubrum* (L.), *Bull. Ess. Inst.* vi. [Aug. 1874], with a woodcut.

Chiton bergoti and *constanti*, spp. nn., Vélain, *Arch. Z. expér.* vi. pp. 123 & 124, pl. iv. figs. 19-22, St. Paul and Amsterdam Islands.

Chiton (Tonicia) marmoreus (Fabr.), Franklin-Pierce Bay, 79° N. lat., E. Smith, *Ann. N. H.* (4) xx. p. 139.

Stimpsoniella (Carpenter, 1874) probably = *Symmetrogephyrus* (Middendorff); Dall, *Bull. Ess. Inst.* vi. [Aug. 1874].

TECTIBRANCHIA.

TORNATELLIDÆ.

Ringicula conformis, sp. n., Monterosato, *J. de Conch.* xxv. p. 44, pl. ii. fig. 4, Algiers.

Actæon exilis (Jeffr., 1870), new localities; Jeffreys, *Ann. N. H.* (4) xix. p. 335.

BULLIDÆ.

Tornatina hofmani and *brenchleyi*, spp. nn., Angas, *P. Z. S.* 1877, p. 39, pl. v. figs. 19 & 20, Port Jackson.

Cylichna alba (Brown), widely distributed in the arctic zone, new localities and synonymy; Jeffreys, *Ann. N. H.* (4) xix. p. 333. The same and *C. striata* (Brown), found at Discovery Bay, 81° N. lat.; E. Smith, *Ann. N. H.* (4) xx. pp. 139 & 140.

Cylichna avisculpta, Grillo, *Descr. esp. nouv.* p. 11, Messina (near *umbilicata*, Mont.); *C. elegans*, Angas, *P. Z. S.* 1877, p. 175, pl. xxvi. fig. 19, Port Stephens, New South Wales: spp. nn.

Bulla fragilis, sp. n., Vélain, *l. c.* p. 128, pl. iv. fig. 31, St. Paul Island.

Utriculus substriatus, sp. n., *obtus* (Mont.), living animal and varieties described, *hyalinus* (Turt.) synonymy and new localities; Jeffreys, *Ann. N. H.* (4) xix. pp. 333-335.

Diaphana brazieri, sp. n., Angas, *P. Z. S.* 1877, p. 175, pl. xxvi. fig. 20, Port Jackson.

Hydatina inflata, sp. n., Dunker, *Mal. Bl.* xxiv. p. 69, Japan.

Scaphander puncto-striatus (Mighels, 1841) = *librarius* (Lovén). Living animals and new localities; Jeffreys, *Ann. N. H.* (4) xix. p. 335.

Philine ossiani-sarsi, sp. n., Friele, *N. Mag. Naturv.* xxiii. [1876]; *JB. mal. Ges.* iv. p. 264, Northern Norway, 4500 fathoms.

APLYSIIDÆ.

Aplysia fasciata (Poir), *depilans* (L.), *cuvieri* (Ohiage), and *welbi* (Beneden) observed on the coast of Algeria; Monterosato, *J. de Conch.* xxv. pp. 45-48.

NUDIBRANCHIA.

P. S. ARRAHAM publishes a list of all described species of *Anthobranchiata*, with short description of the genera, and indication of synonyms and localities. He arranges them as follows:—

Fam. 1.—*Dorididae*. Mantle large, without marginal appendages, skin generally very spiculate; dorsal tentacles laminate and retractile between cavities.

§ 1.—*Platyglossæ*. Oral tentacles free; odontophore [radula] broad, and bearing numerous spines in each transversal row. Gen. *Doris* (L), 157 species, distribution world-wide. *Angasiella* (Crosse), 1 sp., Port Jackson. *Centrodoris* (Bergh), 3 sp., Philippines. *Chromodoris* (Alder & Hanc.), 97 sp., Mediterranean, Red Sea, Indian and Pacific Sea, Australia. *Orodoris* (Bergh), 1 sp., Tahiti. *Ceratodoris* (Gray), 1 sp., Waigiu. *Hexabranchus* (Ehrenb.), 18 sp., Red Sea, Indian and Pacific Ocean.

§ 2.—*Leptoglossæ*. Oval tentacles united into an oral veil; odontophore narrow and strap-shaped, bearing but few spines in each transverse row. *Calycidoris* (Abrah.), 1 sp., locality unknown. *Lamellidoris* (Ald. & Hanc.), 23 sp., North Europe, Eastern North America, and New Zealand. *Acanthodoris* (Gray), 3 sp., same distribution.

Fam. 2.—*Polyceridae*. Mantle small or obsolete, generally with marginal appendages, integument usually spiculate, dorsal tentacles often laminated.

§ 1.—*Euryglossæ*. Dorsal tentacles retractile within sheaths; odontophore broad. *Miamira* (Bergh), 1 sp., Indian Seas. *Casella* (H. & A. Ad.), 2 sp., Pacific, Philippines and Australia. *Kalinga* (Ald. & Hanc.), 1 sp., Coromandel coast. *Triopa* (Johnst.), 9 sp., Europe, California, Pacific, and New South Wales. *Thecacera* (Flem.), 3 sp., British. *Crimora* (Ald. & Hanc.), 1 sp., Guernsey. *Plocamophorus* (Rüpp. & Leuck.), 10 sp., Red Sea, Indian and Pacific Ocean. *Ægires* (Lovén), 3 sp., Northern Europe. *Notodoris* (Bergh), 1 sp., Rarotonga. *Ceratosoma* (Ald. & Rv.), 8 sp., Indian and Pacific Oceans, W. Australia, ? Canary Isles [also Red Sea]. *Trevelyana* (Kelaart), 11 sp., Indian Seas. *Nembrotha* (Bergh), 1 sp., Philippines.

§ 2.—*Stenoglossæ*. Dorsal tentacles not retractile; odontophore narrow. *Goniodoris* (Forbes), 9 sp., Europe, Indian Seas, Australia. *Aethedoris* [infra, p. 53], 1 sp., Madras. *Idalia* (Leuck.), 7 sp., European seas and China. *Ancula* (Lovén), including *Drepania* (Lafont), 3 sp., Northern Europe and Eastern North America. *Polycera* (Cuv.), 9 sp., Northern Europe, Australia, and ? Cape of Good Hope. *Brachychlanis* (Ehrenb.), 1 sp., Red Sea.

Fam. 3.—*Doriopsidae*. No well-developed spicula in the mantle; mouth suctorial, no odontophore, jaw or spinous collar. *Doriopsis* (Ald. & Hanc.), 72 sp., nearly in all seas.

P. Z. S. 1877, pp. 196–247.

R. BERGH has proposed an order *Ascoglossa*, a part of the *Opisthobranchiata*, which coincides with the *Sacoglossa* of Ihering [see Zool. Rec. xiii, Moll. p. 20], and admits in it the following families: *Hermaeidae*, *Phyllobranchidae*, *Placobranchidae*, *Elysiidae*, *Limapontiidae* and *Oxynoidae*. Verh. z.-b. Wien, xxvii. pp. 807–809.

DORIDIDÆ.

The species of *Doris* named and described by Ehrenberg in 1831 are redescribed and criticised by R. BERGH, from an examination of the typical specimens in the Berlin Zoological Museum, and the original drawings, in the following manner: *Doris* (*Glossodoris*) *xantholeuca* and *erythraea*, (*Actinodoris*) *sponsa* and (*Pterodoris*) *picturata* belong to *Chromodoris*; the first = *pallida* (Leuck.), the third probably = *quadricolor* (Leuck.), and = *elisabethina* (Bergh). *D.* (*Dendrodoris*) *lugubris* and *cuprea* belong to *Doridopsis*, *granulata* to *Discodoris*, *ornata* to *Trippa*. *Brachychlanis pantherina* cannot be referred to any known genus. *Actinocyclus* belongs to Bergh's genus *Sphærodoris*. *Asteronotus hemprichi* and *Hexabranchus prætextus* are to be maintained as distinct genera and species. The other subgeneric and generic names given by Ehrenberg are repudiated. JB. mal. Ges. iv. pp. 45–76.

Doris repanda (Ald. & Hanc.) and *bilamellata* (L.), described from specimens procured in the "Valorous" Expedition; Jeffreys, Ann. N. H. (4) xix. p. 337.

Doris coriacea, South Africa, Seychelles, Sir C. Hardy's Island, *infra-maculata*, Amboina, *infra-nervata*, Mediterranean, *tabulata*, locality unknown, *hepatica*, Pacific, *mailla* (Bergh, MS.), Seychelles and Samoa Islands, *subtumida*, Mediterranean, *speciosa*, Amboina, *stragulata*, locality unknown, *vestita*, Straits of Magellan, *murrea*, Mauritius, *granulosa*, New Zealand, *longula*, New Zealand, *cucullata*, locality unknown, *analampulla*, Australian Seas, *labifera*, Seychelles, *lanuginata*, New Zealand, *collatata*, Port Essington, *muscula* [-us], New Zealand, *pustulata*, Australian Seas, *rariopilosa*, locality unknown, *mollipustulata*, locality unknown, *peculiaris*, South Australia, *prætenera*, New South Wales, *wellingtonensis*, New Zealand, and ? *delicata*, Chiloe, spp. nn., Abraham, P. Z. S. 1877, pp. 247–259, pls. xxvii. & xxviii., xxix. figs. 1–19, & pl. xxx. figs. 10–17.

Doris tuberculata (Cuv.), var. [?], from Kerguelen Island, E. Smith, Transit Venus Exp. Moll. p. 17 [supra, p. 6].

Chromodoris (Ald. & Hanc.). List of known species continued, *elisabethina*, *annæ*, *runcinata*, *semperi*, *virginea*, and *pustulans*, spp. nn., and *striatella* (Bergh, 1874), all from the Philippines, *scurra* (Bergh, 1875), var. from Pelow Islands, and *tryoni* (Garrett, as *Goniodoris*), from Tahiti, externally and anatomically described; Bergh, in Semper's Reis. Philippin. ii. part 21, pp. 461–494, pls. li.–liv. C. ? *mollita*, sp. n., Abraham, P. Z. S. 1877, p. 260, pl. xxx. figs. 18 & 19, locality unknown.

Platydoris, g. n. "Corpus applanatum, coriaceum, rigidum, dorso minutissime granulatum; apertura branchialis stellata; podarium margine anteriore bilabiatum, labio superiore profunde fisso. Armatura labialis nulla. Lingua rhachide radulæ nulla, pleuris multidentatis, dentibus hamatis. Prostata magna. Penis orbiculis duris, medio in uncum evolutis instructus; vagina cuticula crassiore vel armatura simili instructa." *D. argo* [-us] (L.), *P. philippii*, new name for *D. stellata* (Philippi, nec Gmel.), *D. formosa* and *elliotti* (Ald. & Hanc.), *variolata*, *punctiolata*, *punctata*, *canariensis* (Orb.), *striata* (Kelaart), and *scabra* (Cuv.), belong to this genus; Bergh, JB. mal. Ges. iv. pp. 73 & 74.

List of known species, 16 in number; *argo* (L.), anatomically described, *angustipes* (Möreh), with var. n. *alaleta*, West India, *philippii*, sp. n., [see *antea*] Mediterranean, *eurychlamys* and *arrogans*, spp. nn., Philippines (the last perhaps = *Doris cruenta* (Quoy & Gaim.), externally and anatomically described; *id.* in Semper's Reis. Philipp. ii. part 22, pp. 495-517, pls. lviii.-lx.

Discodoris, g. n. "Corpus depressum, circumferentia rotundata vel ovali, ut plurimum sat molle, supra granulatum. Apertura branchialis leviter crenulata vel bilabiata. Margo anterior podarii bilabiatum, labio superiore fisso. Laminæ labiales hamulis minutis formatæ. Lingua rhachide nuda, pleuris multidentatis, dentibus hamatis. Prostata magna. Penis inermis." To this genus belong *Doris granulata* (Ehrenb.), *pardalis*, *concinna*, and *fragilis* (Ald. & Hanc.), and eight as yet undescribed species from the East and West Indies. *Id.*, JB. mal. Ges. iv. p. 61 List of 11 known species, and *D. boholiensis*, *meta*, *cebuensis*, *opisthodia*, *morphea*, Philippines, *notha* and *muta*, West Indies, *modesta*, Pelew Islands, spp. nn., externally and anatomically described; *id.* l. c. Semper's Reis. Philippin. ii. part 22, pp. 518-539, pls. lx.-lxii.

Asteronotus (Ehrenberg) anatomically examined, and characterized as follows:—"Forma corporis depressa; consistentia coriacea, sed non dura vel fragilis; dorsum læve, sæpe nodosum, sicut carina mediana instructum; apertura branchialis stellata; podarium ante bilabiatum, labio superiore profunde fisso. Armatura labialis nulla. Lingua rhachide nuda, pleuris multidentatis, dentibus hamatis. Prostata magna: glandula et hasta amatoria; penis inermis." The following species belong to this genus:—*A. hemprichi* (Ehrenb.), *Doris mauritiana* (Quoy & Gaim.), *D. cerebralis* (Gould), and 2 new, *bertrana* and *mabilla*, but not described. *Id.* JB. mal. Ges. iv. pp. 70 & 71, 161-173, pls. i. & ii.

Sphaerodoris (Bergh) [= *Actinocyclus*, Ehrenb.], g. n.:—"Forma corporis ovatum vel rotundatum; dorsum sat domatum [?], cancellatum, papulis obsitum. Tentacula nulla. Branchia foliis simpliciter lamellatis; apertura analis foro centralis. Podarium latum, margine anteriore fortiter emarginatum. Armatura labialis e hamulis minutis formata. Lingua rhachide nuda, pleuris multidentatis; dens primus a reliquis magnopere diversus, uncò brevissimo; dentes reliqui margine apicali solum denticulati. Penis inermis." Two new, not yet described, species from the Philippines, *Actinocyclus verrucosus* (Ehrenb.) and ? *Doris inca* (Alder). *Id.* JB. mal. Ges. iv. p. 66.

Orodoris miamirana, sp. n., Bergh, in Semper's Reis. Philippin. ii. pt. 21, pp. 429 & 430, Zamboanga, Philippines.

Hezabranthus (Ehrenb.) thus characterized :—"Corpus molle, magnum, nonnihil depressum, dorso lævi, limbo palliali lato, margine tenui undulato, branchia e fasciculis fruticulosus discretis compluribus (68), foveis totidem discretis contractilibus formata; tentacula magna, foliacea, margine crispato; rhinophoria collo reflexo; podarium sat latum. Armatura labialis fortissima, utrinque lamella crassa e hamulis minutissimis formata. Lingua rhachide nuda, pleuris multidentatis, dentibus hamatis. Penis inermis, longissimus." The known species enumerated. *Id.* JB. mal. Ges. iv. pp. 72 & 73.

Hezabranthus orbicularis, Mauritius, *aneiteumensis* (Bergh, MS.), New Hebrides, and *mauritanus*, Mauritius and Rodriguez Islands, spp. nn., Abraham, P. Z. S. 1877, pp. 260-262, the first pl. xxx. figs. 23 & 24.

Crepidodoris, g. n. Gills 22, most of them arranged in the figure of a horse-shoe, a few at the end placed more inwards. *C. plumbea*, sp. n., Red Sea. Pagenstecher, in Kossmann's Zool. Ergebnisse, vol. i. pt. 2, p. 61, figs. 35-38.

Acanthodoris mollicella, Lord Auckland Islands, and *globosa*, New Zealand, spp. nn., Abraham, P. Z. S. 1877, pp. 262 & 263, pl. xxx. figs. 1-4, 5-9.

Thordisa, g. n. "Forma corporis et radula fere ut in Discodoridibus, dorso fere villosa. Armatura labialis nulla. Dentes radulæ extimi denticulati. Penis inermis." *T. maculigera*, sp. n., Philippines, externally and anatomically described. *Doris villosa* (Ald. & Hanc, 1864) belongs also to this genus. Bergh, in Semper's Reis. Philippin. ii. pt. 22, pp. 540-542, pl. lxi. figs. 19-24, and pl. lxii. figs. 1 & 2.

Trippa, g. n. "Forma corporis depressa. Corpus sat molle, supra tuberculatum, tuberculis grosse villosis. Tentacula parva. Podarium sat latum, margine anteriore ope lobii capiti connato. Armatura labialis nulla. Lingua rhachide nuda, pleuris multidentatis; dentes hamati. Penis inermis." *T. ornata*, sp. n., Philippines, externally and anatomically described. *Id.* l. c. pp. 543-546, pl. lviii. figs. 3-8. *Doris ornata* (Ehrenberg) also belongs to this genus; *id.* JB. mal. Ges. iv. p. 63.

POLYCERIDÆ.

Trevelyana (Kolaart). The 9 known species enumerated, and *T. citrina* (? = *Doris limacina*, Q. & G.), Pelew Islands, *alba*, Philippines, and *plebeia*, Aibukit, Pacific, spp. nn., anatomically described. Bergh, in Semper's Reis. Philippin. ii. pt. 21, pp. 440-449, pl. lvi. figs. 18-25, pl. lvii. figs. 1-12, pl. liv. figs. 26-35.

Casella atro-marginata (Cuv., as *Doris*), Philippines, Moluccas, New Guinea, Australia; *id.* l. c. pp. 462 & 463.

Nembrotha, g. n. "Corpus limaciforme, dorsum a lateribus non discretum. Tentacula breviora, lobiformia; rhinophoria retractilia. Branchia paucifoliata, non retractilia, fere in medio dorsi sita. Podarium angustius. Armatura labialis parva vel nulla? Dentes radulæ mediani depressi, subquadrati vel arcuati, laterales pro majore parte depressi,

subquadrati vel transversales, intimi hamati, falciformes. Glandula hermaphroditica a hepato non discreta. Penis fore ut in *Phyllidiis* seriebus hamorum armatus." *N. nigerrima*, *gracilis*, *morosa*, and *cristata*, Philippine Islands, *kubaryana*, Pelew Islands, *diaphana*, Aibukit, Pacific, spp. nn., most of them also anatomically described. *Angasiella edwardsi* (Angas) perhaps also belongs to this genus. R. Bergh, in Semper's Reis. Philippin. ii. pt. 21, pp. 450-461, pls. lv. & lvi.

Plocamophorus. Anatomical description; *id. l. c.* pt. 11.

Plocamopherus [-*phorus*] *flagellatus* (Krusenstern, Reise 1811-1814, pl. lxxxviii. figs. 7-10), *levivarius*, sp. n., Abraham, Bull. Soc. Zool. Fr. 1877, p. 288, locality unknown. *P. tilesii*, sp. n., Bergh, in Semper's Reis. Philippin, ii. pt. 21, pp. 431-439, pl. lii. figs. 17-27, pl. liii. figs. 1-4, Japan, full anatomical description.

Aethedoris, g. n.; head bilobed, each lobe semicrescentic, its margin 12-14 dented. *A. indica* (figured by Alder & Hancock, Tr. Z. S. v. 1864, pl. xxxiii. fig. 20, as an unknown genus), Madras Coast. Abraham, P. Z. S. 1877, p. 237.

DORIDOPSISÆ.

Doridopsis australiensis, New South Wales, *obscura*, *fumca*, and *fedata*, localities unknown, *inornata*, Mediterranean, *subpellucida*, St. Vincent, West Indies, *mammosa*, locality unknown, *variata*, China, and *parva*, locality unknown, spp. nn., Abraham, P. Z. S. 1877, pp. 263-267, pl. xxix. figs. 20-24, pl. xxx. figs. 25-36.

See also *Doris lugubris* and *cuprea* (Ehrenb.), *antea*, p. 50.

TRITONIIDÆ.

Hancockia, g. n. Body linear, scarcely palliate, head produced on each side into a broad, flat, many-fingered veil. Dorsal tentacles with laminated bulbs, retractile within sheaths. Branchiæ 3 pairs, foliate, pinnatifid, infolding, remotely situated on the subpalliate margin of the back. Foot linear, grasping. *H. eudactylota*, sp. n., Torquay. Gosse, Ann. N. H. (4) xx. pp. 316-319, pl. xi.

Tethys leporina (L.). Observations on the living animal, its movements, and eggs; R. Bergh, JB. mal. Ges. iv. pp. 335-339.

Marionia, g. n. "Corpus elongatum, lateribus compressis, pallio nullo; velum parvulum, ramosum. Tentacula dorsalia ramusculis tenuibus condensis superne cincta. Branchiæ ramosæ, linea unica utrinque dorsi insertæ. Maxillæ corneæ. Stomachus dentibus cultriformibus armatus." Very much resembling *Dendronotus*, but the stomachal armature is that of *Scyllæa*. No species is named or described as a type, reference only being made to "un curieux Tritoniadé" found in the Gulf of Marseilles, 50 mètres. A. Vayssière, C. R. lxxxv. pp. 299-301; Ann. N. H. (4) xx. pp. 367 & 368.

Lomanotus hancocki, sp. n., Norman, Ann. N. H. (4) xx. p. 518, Torbay.

ÆOLIDIDÆ.

Æolidia papillosa (L.) Note by R. Bergh, Verh. z.-b. Wien, xxvii. p. 822.

Eolis aurantiaca (A. & H.). Larva having lost the embryonal shell described by Giard, Bull. Soc. mal. Belg. xi. p. 8.

Eolis salmonacea (Gouth). Young individual procured in the "Valorous" Expedition described by Jeffreys, Ann. N. H. (4) xix. p. 336; the same from Discovery Bay, 81° N. lat., E. Smith, Ann. N. H. (4) xx. p. 140. *E. sanguinea*, sp. n., Norman, Ann. N. H. (4) xx. p. 517, Conne-mara.

Facelina coronata (Forbes) anatomically described; R. Bergh, Verh. z.-b. Wien, xxvii. pp. 824-829, pl. xii. figs. 11-15, pl. xiii. figs. 1-5.

Favorinus albus (A. H.), Note on; *id. l. c.* p. 822.

Galvina farrani and *exigua* (Ald. & Hanc.) anatomically described; *id. l. c.* pp. 830-836, pl. xiii. figs. 6-20, 21-27.

HERMEIDÆ.

The known genera and species enumerated. They are:—*Hermæa* (Ald.) 9 species, *Stiliger* (Ehrenb.) 6, *Ercolania* (Trinchese) 3, and *Alderia* (Allm.), 4 species. R. Bergh, Verh. z.-b. Wien, xxvii. pp. 809-811.

Hermæa dendritica (Ald. & Hanc.) anatomically described; S. Trinchese, Mem. Acc. Bologn. (3) vii. pp. 449-464, with 2 pls.

Ercolania viridis (Costa, as *Embletonia*) and var. *nigro-vittata* (Costa), from Naples, anatomically described; R. Bergh, Verh. z.-b. Wien, xxvii. pp. 814-822, pl. xi. figs. 1-19, and pl. xii. figs. 1-5.

Caliphylla mediterranea (Costa) anatomically described; S. Trinchese, Mem. Acc. Bologn. (3) vii. 1876, pp. 173-192, with 2 pls.

Fiona marina (Forsk., as *Limax*) = *nobilis* (Ald. & Hanc.), Atlantic and Mediterranean; R. Bergh, *l. c.* p. 823.

Solenopus, Sars, Förh. Selsk. Christ., 1868, = *Vermiculus*, Dalyell, "Power of Creation," ii. (1853) = *Neomenia*, Tullberg, 1875 [see Zool. Rec. xii. p. 544]. A new order among the *Opisthobranchia*, to be called *Teliobranchiata*, is proposed for this genus, with the following characters:—Sexes united. No tentacula, no eyes, no radula, no jaw, no shell. Body more or less worm-shaped. Foot long, narrow, entirely hidden by the mantle. Gills at the hinder end of the animal, retractile. Heart rather developed. Body cavity entirely filled with entrails. Generative organs situated along the back above the stomach and intestine. Nervous system composed of a suprapharyngeal circle with cerebral ganglion and of two pedal ganglions. The following species are described:—*S. nitidulus* (Sars) = *Neomenia carinata* (Tullb.), coast of Norway, from Bohuslän to the Lofodens, also within the fjords, 200-300 fathoms, everywhere very rare; anatomical description given. *S. affinis*, sp. n., Messina, 20-30 fath., *dalyelli*, sp. n., perhaps = *Vermiculus roseus*

(Dalyell), Northern Atlantic, Lofoden Islands, and Finmark, 60–150 fath., *incrustatus*, sp. n., Finmark, 200–300 fath., *margaritaceus*, sp. n., Stavanger, Norway, 40–60 fath., *borealis*, sp. n., Northern Atlantic, Lofoden Islands, 40–400 fath., *sarsi*, sp. n., Fjord of Christiania, Norway, 100–120 fath.; Koren & Danielsen, Arch. Math. Naturvid. 1877 (separate print, 11 pp.). [*Solenopus* is not entitled to priority, having been given without any description; Tullberg, JB. Anat. Physiol. vi. 1878, p. 88, footnote.]

Graff gives, from personal examination, several additions to and explanations of Tullberg's anatomical description of *Neomenia*, chiefly concerning the nervous system, stating the presence of a second simple nervous ring round the œsophagus, the origin of the large lateral nerves from a distinct lateral ganglion on both sides of the pharynx, and the presence of direct commissures between the longitudinal abdominal nerves, these commissures perforating the venous sinus. He agrees with Ihering in the view that *Neomenia* is the lowest form of Mollusks, and at the same time very near to *Chatoderma* (Lovén). Z. wiss. Zool. xxviii. pp. 557–570, with woodcuts.

PULMONATA.

The 8th volume of PFEIFFER'S "Monographia Heliceorum" contains the genera *Bulimus*, *Partula*, *Auriculella* (formerly a subgenus of *Achatinella*), *Achatinella*, *Carelia*, *Columna*, *Rhodea*, *Spiraxis*, *Ravenia*, *Orthalicus*, *Perideris*, *Pseudachatina*, *Limicolaria*, *Achatina*, *Geostilbia*, *Ferussacia*, *Azeca*, *Oleacina*, *Streptostyla*, *Pupa*, *Zospeum*, *Pineria*, *Macroceramus*, *Cylindrella*, *Berendtia*, *Caliaxis*, *Megaspira*, *Balea*, and *Clausilia*; all the species are enumerated, with synonyms and localities, and the descriptions of those published after the issue of the 6th vol., 1868, are copied from the original works. In the "Addenda," the new species of *Helix*, *Succinea*, &c., not in vol. vii., are given.

L. PFEIFFER makes some general remarks on the systematic arrangement of the *Helicidae* by different authors, with some hints towards a natural system. Mal. Bl. xxiv. pp. 1–14, 75–84.

ONCHIDIIDÆ.

Peronia. H. v. Ihering insists on the fact that this genus lives between high and low water [which has also been observed by the Recorder], and defends the branchial quality of the dorsal appendages, they being well provided with blood-vessels. Respiration may be effected in the air by the pulmonary cavity at the hinder end of the animal, and in the water by the whole skin, aided especially by the branchial appendages. SB. Soc. Erlang. ix. pp. 141–144. [This was also the opinion of Ehrenberg.]

Onchidium. Eyes on the dorsal tubercles (see above in the General Subject, Anatomy and Physiology). The genital organs in this genus have been examined by C. SEMPER; he arranges the 18 species, examined anatomically, according to the cartilaginous, or softer consis-

tence of the male organ, and the presence or absence of an occasional gland in it, in six groups, which do not wholly correspond to the groups made with regard to the modifications of the eyes; Reis. Philippin. iii. suppl. pp. 39 & 40. He states also that the geographical distribution of the species provided with dorsal eyes coincides with that of the genus *Periophthalmus* (fish), and supposes that those eyes serve to perceive the approach of this enemy, in which case the animal will defend itself by rapidly expelling many drops of slime; *l. c.* pp. 31 & 32.

Onchidella (Gray), distinguished by the respiratory orifices being placed on the right side of the vent and the male orifice on the right side of the tentacles; whereas in *Onchidium* both are in the median line, the former behind the vent, the latter behind the tentacles; no dorsal eyes. Semper, *l. c.* p. 40.

VAGINULIDÆ.

Vaginula (Fér.). O. Fischer gives a general account of the genus, enumerating the known species, and describing as new *V. brevis*, Zanzibar, *maillardi*, Bourbon, *seychellensis*, Seychelles, and *gayi*, Valdivia; he also gives figures of *V. sloanii* (Fér.), *occidentalis* (Guilding), *moreleti* (Crosse & Fisch.), *seychellensis*, sp. n., and *plebiea* (Fisch.), drawn from living specimens, with jaw and radula of the last. N. Arch. Mus. vii. pp. 147-175, pl. xi. figs. 1-12.

Vaginula occidentalis (Guilding). Anatomical figures by Crosse & Fischer, Moll. terr. et fluv. de Méxique, pt. 6, pl. xxviii. figs. 21-26. *V. moreleti*, sp. n., living animal figured, pt. 5, pl. xxiv. fig. 14.

AGNATHA (TESTACELLIDÆ).

A general description of this family and list of the known genera (*Streptaxis* and *Ennea* not included), by Strebel, Mexik. Land- u. Süsw. Conch. iii. pp. 3-7. A small median tooth in the radula was found in almost all the species examined.

Daudebardia heldi (Clessin), Bavaria, *nivalis* (Benoit), Sicily, *sicula* (Benoit), Sicily, *langi* (Pfr.), Hungary, and *transylvanica* (Bielz), Transylvania; Kobelt, Iconogr. v. pp. 79-84, pl. cxli. figs. 1388-1390, 1396 & 1397. The Algerian species copied from Bourguignat, *l. c.* figs. 1391-1395.

Marchia concolor (Fér., as *Helix*). Embryonal shells and radula described, the latter without median tooth; Martens, JB. mal. Ges. pp. 344 & 345.

Strebelia berendti (Pfr.). Its anatomy given and its systematic place among the *Testacellidæ* confirmed by H. Strebel, Mexik. Land- u. Süsw. Conch. iii. pp. 9 & 10, pls. i. & ii.

Glandina. H. Strebel admits *Varicella*, *Oleacina*, s. str., and a special section for the European species, *G. algira* (Brug.), as subgenerically distinct from *Glandina*, s. str., giving a full description of the living animal, habits and anatomy of *G. sowerbiana* (Pfr.), pp. 35-44, and anatomical notes on *conferta* (Pfr.), *amæna* (Martens), *coronata* (Pfr.), *uhdeana* (Martens), and *liebmanni* (Pfr.), and 2 new species; Mexik.

Land- u. Süßsw. Conch. iii. pp. 31-46, pl. x. figs. 8-17, & pls. xiii.-xxii., anatomy, pl. xi. figs. 1-7, radula.

G. miradorensis, sp. n., = *aulebardi* var. B., of the former part of the same work, p. 33, pl. xi. fig. 20, *estefaniae*, sp. n., = *sowerbiana*, var. D. of the same, p. 17, pl. v. fig. 11, *lineata*, sp. n., Miahuatlan, and *polita*, sp. n., locality not indicated, no median tooth in the radula; Strebel, *l. c.* pp. 33, 45, 47, & 48, pl. ix. figs. 10 & 14, pl. xii. figs. 3 & 13, pl. xxii. fig. 1. Shells of *G. turris*, *conferta*, *sowerbiana*, and *liebmanni* (Pfr.) again figured; *l. c.* pl. ix. figs. 11 & 12, & pl. xii. figs. 1, 2, & 4.

Glandina algira (Poir.) varr. *tumida* (Villa), *intermedia* (Martens), *angustata* (Villa), and *microstoma* (Kobelt) = *G. algira*, *compressa*, and *dilatata* (Mouss.), Dalmatin, Italy, Ionian Islands, and Algeria; Kobelt, Iconogr. v. pp. 55-57, pl. cxxxiv. figs. 1313-1316.

Salasiella, g. n.; small shells like *Glandina*, glossy, and vertically striate; columella truncated; labial feelers wanting. Stomach simple (as in *Streptostyla*, double in *Glandina*). *S. joaquinae*, sp. n., Jalapa, *perpusilla*, and ? *modesta* (Pfr., as *Oleacina*), all from Mexico. Strebel, Mexik. Land- u. Süßsw. Conch. iii. pp. 6, 29, & 30, pl. x. figs. 1-7, anatomy of the first, pl. xi. fig. 8, radula of the same, pl. ix. figs. 6, 8, & 9 shells of all three.

Streptostyla (Crosse & Fisch.). H. Strebel gives anatomical descriptions of *S. nicoleti* (Shuttl.), *conformis* (Shuttl.), *shuttleworthi* (Pfr.), and *physodes* (Pfr.), and describes the shells of the following Mexican species, arranging them into small groups, which he names according to the first species:—1st group: *nicoleti* (Shuttl.). 2nd group: *conformis* (Shuttl.), *plicatula*, sp. n., Orizaba, *fulvida* (Cr. & Fisch.), *turgidula* (Pfr.). 3rd group: *shuttleworthi* (Pfr.), *similis*, sp. n., Orizaba, *sallaei* (Cr. & Fisch.), *edwardsiana* (Cr. & Fisch.), *quirozi*, sp. n., Coatepec, *delatirii* (Pfr.). 4th group: *physodes* (Shuttl.), *bocourti* (Cr. & Fisch.). 5th group: *nigricans* (Pfr.), *mitriformis* (Shuttl.), *schneideri*, sp. n., Coban, *crassa*, sp. n., Coban, *sargi* (Cr. & Fisch.), systematic place doubtful, *catenata* (Pfr.), and *vezans*, sp. n., Jalapa. All these species are figured. Mexik. Land- u. Süßsw. Conch. iii. pp. 11-28, 47, 49-51, pls. iii.-v. anatomy, pl. vi. radula, pls. vii. viii. & ix. figs. 1-7, pl. xii. figs. 5-12 & pl. xxii. fig. 2, shells, pl. xxii. fig. 3, living animal of *S. nicoleti*.

Spiraxis: see below in the *Odontognatha*.

Ennea modioliformis, larva, and *acicula*, spp. nn., Morelet, J. de Conch. xxv. pp. 336, 338, & 339, pl. xiii. figs. 3, 4, & 7, Anjoana, Comoro Islands. *Gonaxis*, g. n.; shell pupiform, axis of the apical whorls diverted to the right. *G. gibbonsi*, sp. n., Taylor, Q. J. Conch. No. 12, p. 152, pl. ii. fig. 1, Zanzibar.

Streptaxis bombax (Bs.) figured; W. Theobald, J. A. S. B. xlv. pt. 2, pl. xiv. fig. 6.

OXYGNATHA.

(ZONITIDÆ, VITRINIDÆ.)

G. PFEFFER gives in his inaugural dissertation, "Beiträge zur Naturgeschichte der Lungenschnecken," 1877-8, from numerous personal

observations a general review and comparative morphology of the chief anatomical peculiarities in the *Zonitidae* (part of the *Pulmonata oxygnatha*), principally the sole of the foot, the male genital organs, with critical remarks on the distinction between flagellum and penis, as used by different authors, and finally the radula. He concludes that *Macrochlamys* may represent the type of the family, and that all the rest may be derived from it as differentiated and very often reduced forms in several lines or series.

The spermatophore is formed in a furrowed portion of the vas deferens in *Zonites algirus* (L.), *olivetorum* (Gmel.), and *lucidus* (Drap.); Dubrueil, Rev. Montp. v. [Dec. 1876].

The generative organs of the genera *Arion* and *Limax* are the subject of an academical dissertation by F. A. BENTINK, "Over systematick en generatie - organen van naakte Pulmonaten" (Leiden: 1875, 68 pp. 2 pls.). The anatomical disposition and histological structure of them is fully described and several differences between the two genera pointed out; in *Limax*, e.g., the capreolus is wanting and the receptaculum seminis is much smaller than in *Arion*, and the vas deferens is a tube which is closed all round, whereas in *Arion* it is open laterally and communicates for all its length with the oviduct.

French *Limacidae* figured by Jousseame, Bull. Soc. Zool. Fr. pt. 4, Oct. & Nov. 1876, pl. iv.

Limax hyperboreus, sp. n., Westerlund, Sv. Ak. Handl. (2) xiv. pt. 2, No. 12, p. 21, Sopotschnoj on the Yenissei, 70° N. lat.

Limax agrestis (L.)?, Japanese specimen; Martens, SB. nat. Fr. 1877, p. 99.

Limax variegatus (Drap.) common in cellars in several towns of Northern Germany; Wiegmann, Nachr. mal. Ges. 1877, pp. 8-10.

Limax altilis, sp. n., Fischer, J. de Conch. xxv. p. 49, Caunterets, Pyrenees.

Parmacella. The known European and North African species described and figured; partly copied from other authors; Kobelt, Iconogr. v. pp. 58-60, pl. cxxxiv. figs. 1317-1321.

Parmarion kersteni: see below in the *Elasmognatha*.

Limax etruscus (Issel) anatomically examined by Sordelli, Bull. mal. v. 1872, pp. 5-14, pl. i.; it belongs to *Amalia* (Moq. T.), and perhaps = *A. marginata* (Drap.).

Vitrina diaphana (Drap.), *heynemanni* (C. Koch), Middle Germany, *elongata* (Drap.), *gracilis* (Forbes), *brevis* (Fér.), Southern Germany and Alps, *pyrenaica* (Fér.), *major* (Fér.), *annularis* (Stud.), *servainiana* (St. Simon), Pyrenees, and *charpentieri* (Stabile) = *nivalis* (Charp.), Alps, above 6000 feet. Kobelt, Congr. v. pp. 84-80, pl. cxli. figs. 1388-1408. [The figures scarcely sufficient for recognition.]

Vitrina major (Fér.) and *pellucida* (Müll.) from Paris, described by F. Jousseame, Bull. Soc. Zool. Fr. pt. 4, Oct. & Nov. 1876, pp. 184-190, pl. iv. figs. 7-9.

Vitrina baudoni, sp. n., Delaunay, J. de Conch. xxv. p. 363, pl. xi. fig. 5, Cherbourg.

Vitrina ruivensis (Couth.) distinct from *lamarcki* (Fér.); Watson, J. de Conch. xxv. p. 227.

Helicarion resplendens, Sawady, and *magnificus* (Godwin-Austen, MS.), Yunnan, spp. nn., Nevill, J. A. S. B. xlv. pt. 2, pp. 23 & 24, with notes on some other species of Indian *Helicarion*.

Nanina. General notes on the distinction of cervical and shell-covering lobes of the mantle in this and allied genera, as proposed by C. Semper, are given by G. Pfeffer, JB. mal. Ges. iv. pp. 326-328.

Nanina rufa (Lesson, 1830) = *novae-hiberniae* (Q. G.), New Ireland, and *N. explanata* (Q. G.) = *exilis* (Pfr., nec O. Fr. Müll.), New Guinea, the latter figured by Martens, MB. Ak. Berl. 1877, pp. 266-268, pl. i. figs. 1-3.

Nanina scalpta, now name for *rufa* (Pfr., Roove, nec Lesson), from Mauritius; *id.* l. c. p. 267.

[*Trochomorpha*] *Helix oleacina* (Semper), Pfeiffer in Chemnitz ed. nov. p. 536, pl. clxiii. figs. 13-15, Pelew Islands.

Zonites cretensis, sp. n. (Blanc, MS.), Martens, in Pfeiffer's Novitat. v. p. 36, pl. cxliv. figs. 5-8, Crete.

Hyalina (Fér.). 13 subgenera enumerated; L. Pfeiffer, Mal. Bl. xxiv. pp. 9-14.

Hyalina, subg. *Vitrea* (Fitzinger) [= *Crystallus*, Lowe]. S. Clessin admits and describes the following species:—*crystallina* (Müll.) with var. *subterranea* (Bourg.); *contracta* (Westerlund) = *crystallina* of Reinhardt, 1871, *botteri* (Parr.), *dubrucei*, sp. n., Southern France, *subcarinata*, sp. n., Transsylvania, *narbonensis*, sp. n., Southern France, *jickelii*, sp. n., Transsylvania, *subrimata* (Reinhardt), *litoralis*, sp. n., Görz, Austrian Coast, *diaphana* (Stud.), and *transylvanica*, sp. n., Transsylvania. Mal. Bl. xxiv. pp. 123-134, all figured, pls. 1 & 2.

Hyalina. 17 species living in Japan, including the European *nitida* (Müll.), the North American *minuscula* (Binu.), and the following new:—*radiatella*, *yessoensis*, *hilgendorfi*, *microdiscus*, *danitzi*, (*Conulus*) *pustulina*, and *sinapidium*, Reinhardt, JB. mal. Ges. iv. pp. 313-320; these and *rejecta* (Pfr.), *tenera* and *acutangula* (A. Ad.), figured, pl. ix. figs. 5-9, & pl. x. figs. 1, 3-7; also SB. nat. Fr. 1877, pp. 68 & 69, 89-95. *H. mollendorffi*, sp. n., Tachiaosse, near Peking, *id.* l. c. p. 317, pl. x. fig. 2.

Hyalina insecta, sp. n., near *indentata* (Say), Martens, JB. mal. Ges. iv. p. 345, pl. xii. fig. 3, Porto Rico.

Zonites ventrosa, sp. n., (Gibbons, MS.) Taylor, Q. J. Conch. No. 12, p. 253, pl. ii. fig. 2, Zanzibar [probably a young shell, perhaps of an *Ennea*].

ODONTOGNATHA.

Arion. Anatomical differences from *Limax* pointed out by Bontink (see preceding page).

Arion lusitanicus (Mabille) distinct from *rufus* (L.); Morelet, J. de Conch. xxv. p. 243.

Helix. L. Pfeiffer has continued the monograph of this genus in the new edition of Chemnitz (interrupted since 1854), pt. 260, pp. 527-562, Nos. 1108-1164, pls. clxii.-clxvii. The new species and those not before figured will be mentioned *infra*.

Helix. European species, including those of the African and Asiatic Shores of the Mediterranean :—

[*Patula*] *Helix hierosolymitana* (Roth.), Jerusalem, *micropleurus* (Paget), Southern France and Sardinia, *hauffeni* (F. Schmidt), caverns of Carniolia, and *zapateri* (Hidalgo), Spain ; Kobelt, *Iconogr.* v. pp. 93 & 94, pl. cxlii. figs. 1416–1419. *Helix tenuicostata* (Shuttl., *neo Dunker*) = *micropleurus* (Paget), Kobelt, *Nachr. mal. Ges.* 1877, p. 60; this species found near Viareggio, province of Lucca ; Paulucci, *Bull. Soc. mal. Ital.* iii. pp. 13–15.

Helix zanellia (Testa), *deshayesi* and *schwerzenbachiana* (Calcare), *templorum* and *boconiana* (Benoit) are young specimens of *Pupa*, probably *callicratis* (Scacchi), *doliolum* (Brug.), and *umbilicata* (Drap.) ; *H. brocchiana* and *cupaniana* (Calcare), young specimens of the well-known *Helix rotundata* (Müll.) ; Reinhardt, *J.B. mal. Ges.* iv. pp. 277–283.

Patula hookeri (Rv., as *Helix*) from Kerguelen Island, foot, jaw, and radula described ; Martens, *MB. Ak. Berl.* 1877, pp. 269–271, pl. ii. figs. 5–10. Notes on the living animal ; Eaton, *Transit Venus Exp., Moll.* p. 17 [*antea*, p. 6].

Leucochroa candidissima (Drap.). Anatomical notes by Dubrueil, *Rev. Montp.* v. Dec. 1876.

Leucochroa otthiana (Forbes), *argia* (Bourg.), *boissieri* (Charp.), *filia* (Mouss.), *prophetarum* (Bourg.), *cariosa* (Oliv.), and *fimbriata* (Bourg.) ; Kobelt, *Iconogr.* v. pp. 46–51, pl. cxxxi.

Leucochroa mograbina (Morelet) and *degenerans* (Mouss.), from Morocco, have a ribbed jaw, a well-developed arrow-bag (in the former species divided into two lobes, and containing two arrows), and eight glandulæ mucosæ. Schepman, *Tijdschr. Nederl. dierk. Ver.* ii. [1876] pp. 1–6 ; *J.B. mal. Ges.* iv. 1877, pp. 271 & 272, with woodcuts. This has also been observed by Kobelt, *Nachr. mal. Ges.* 1875, p. 37.

[*Vallonia*] *Helix tenuilabris* (A. Braun), very near *pulchella* (Müll.), found in the recent state near Geislingen, Württemberg ; Oberndorfer, *Nachr. mal. Ges.* 1877, pp. 21–23.

Helix (Vallonia) adela (Westerlund), Siberia, on the Yenissei, 56° & 68° N. lat. ; Westerlund, *Sv. Ak. Handl.* (2) xiv. 2, No. 12, p. 38, near *tenuilabris* (A. Braun).

[*Acanthinula*] *Helix harpa* (Say) ; Kobelt, *Iconogr.* v. p. 94, pl. cxlii. fig. 1420.

Helix lamellata (Jeffer.). The living animal described by R. Rimmer, *Q. J. Conch.* No. 13, p. 265.

[*Caracollina*] *Helix lenticularis* (Morelet), Morocco and Tarifa, *tarnieri* (Morelet), Southern Spain, *boscæ* (Hidalgo), Valencia, *asturica* (Pfr.), Northern Spain, *constricta* (Boubée), Pyrenees, *lusitanica* (Pfr.), Portugal, and *gougeti* (Terver), Algeria ; Kobelt, *Iconogr.* v. pp. 90–92, pl. cxlii. figs. 1409–1415.

[*Nummulina*, Kob.] *Helix nicosiana* (Mouss.), Cyprus, *nummus* (Ehrenb.), Syria, and *spiroxia* (Bourg.), Syria ; *id. l. c.* pp. 26 & 27, pl. cxxvi. figs. 1213–1215.

[*Fruticicola*] *Helix galloprovincialis* (Dupuy) var. ♀, Sebastopol,

inchoata (Morelet), Portugal, *martensiana* (Tiberi), Abruzzi, *apennina* (Porro), Abruzzi, *cantiana* (Mont.), from Kent and Belgium, = *ancona* (Issol), Tuscany, and = *frequens* (Mouss.), European Turkey, *pirajnea* (Benoit), Sicily, *dirphica* (Martens), Eubœa, *apennina* var. n. *euboica*, Eubœa, *berytensis* (Fér.), *schuberti* (Roth.), *orsinii* var. n. *majellæ*, Central Apennines, and *parreyssi* (Pfr.), Abruzzi; *id. l. c.* pp. 19-26, pls. cxxv. & cxxvi. figs. 1206-1211. *H. circassica* (Charp.); *id. l. c.* p. 78, pl. cxl. fig. 1386.

Helix druventiana, valley of the Durance, dep. Hautes-Alpes, *diæga*, on rocks in dep. Alpes-Maritimes, *gelida*, Alpes-Maritimes and Monaco, *concreta*, dep. Basses-Alpes, and *crinoda*, valley of the Var and Monaco, spp. un., allied to *H. telonensis* (Mittre) and *moutoni* (Dupuy); Bourguignat, R. Z. (3) v. pp. 232-249.

[*Xerophila*] *Helix cespitum* (Drap.), *eremophila* (Bourg.), Arabia Petrea, *exposita* (Parr.), Spain, *variabilis* (Drap.), *luteata* (Parr.) Portugal, *arenarum* (Bourg.), Algeria, *cretica* (Fér.) var. ♀, Morea, *terveri* (Mich.), var., Sicily, *acompsia* (Bourg.), Algeria. Kobelt, Iconogr. v. pp. 51-55, pls. cxxxii. & cxxxiii.

Helix pampelunensis (A. Schmidt), Spain, *ammonis* (A. Schmidt), Northern Italy, *obvia* (Ziegl.), Eastern Germany and Hungary, *bathymphala* (Charp.), Abruzzi, *dobrudscha* (Parr.), *vestalis* (Parr.), *obvia*, var. *pullula* (Parr.), Bucharest, *spade* (Calcara), Abruzzi, *moesta* (Parr.), Sicily, *devauxi* (Devaux), Algeria, *dormiens* (Benoit), island Maretimo, Ægæan group near Sicily, *usticensis* (Calcara), Ustica, *tinæana* (Benoit), Sicily, *montserratensis* (Hidalgo), Catalonia, *henoniana* (Bourg.), Algeria, *lederei* (Pfr.), Cyprus, *calamiesiana* (Bourg.), Northern Africa; *B. rufilabris* (Benoit), Sicily, *turbinata* (Jan., Pfr.), Crete, *aradasi* (Pirajno), Sicily, *numidica* (Moq. Tand.), Algeria, *spratti* (Pfr.), Malta, and *calcarata* (Benoit), Malta; Kobelt, *l. c.* pp. 95-107, 111 & 112, pls. cxliii.-cxlv. & pl. cxlvi. figs. 1458-1462 & 1469-1474.

Helix ammonis (A. Schmidt), Upper Italy from the southern slope of the Alps to the northern slope of the Apennines; Strobel, Bull. Soc. mal. Ital. iii. pp. 91-93.

Helix codia (Bourg.) = *caperata* (Mont.); Morelet, J. de Conch. xxv. p. 246.

Helix cucullus, sp. n., Martens, Bull. mal. vi. [1873], p. 27, Malta.

Helix kabyliana (Devaux); Pfeiffer, Chemn., new. ed. p. 559, pl. clxii. figs. 7-9. Djurjura Mountains, Kabylia.

[*Euparypha*] *Helix dehnei* (Rossm.); note by Taylor, Q. J. Conch. No. 11, p. 217.

[*Turricula*] *Helix contermina* (Shuttl.) = *psammæa* (Morelet), Algeria, *pingi* (Pfr.), Portugal, *pumilio* (Chemn.), Mogador, *tuberculosa* (Conrad), Palestine, *tarentina* (Pfr.), Tarento, and *trochlea* (Pfr.), Algeria; Kobelt, Iconogr. v. pp. 107-111, pl. cxlvi. figs. 1462-1465, 1469 & 1470. *H. sequentiana* (Benoit), Sicily, *id. l. c.* p. 112, fig. 1475.

[*Arionta*] *Helix styriaca* (Frauenf.). Genital organs and arrow as in the nearly allied *arbustorum* (L.), radula a little different. Schepman, Nach. mal. Ges. 1877, pp. 38 & 39.

[*Campylaea Helix planospira* (Lam.).] On Lamarck's typical specimen, which is from Italy; Martens, Nachr. mal. Ges. iv. p. 191.

Helix moulinsi (Farines). A hairy variety found at Cauterets; Fischer, J. de Conch. xxv. pp. 53 & 54.

Helix narentana (Kleciach, MS.), sp. n., Kobelt, Nachr. mal. Ges. 1877, p. 76, noar *insolita* (Rossin.), Dalmatia.

Helix cichwaldi (Pfr.), *daghestana* (Parr., in coll.), *appeliuna* (Mouss.), *ravergii* (Kryn.), *transcaucasica* (Bayer), *pratensis* (Pfr.), with several varieties, *narzanensis* (Kryn.), var. *solidior*, and *delabris* (Mouss.), all from the Caucasus; Kobelt, Iconogr. v. pp. 28-32, pl. cxxvii. figs. 1216 & 1217, & pl. cxxvii.

Helix tetrazona (Jan.), arrow described, nearer that of *Pentatania* than *Campylaea*; Schepman, JB. mal. Ges. iv. pp. 268-271, with woodcut.

[*Iberus*] *Helix strigata* (Müll.), several varieties, including *surrentina* (A. Schmidt), *H. carseolana* (Fér.), *circumornata* (Fér.), *serpentina* (Fér.), *muralis* (Müll.), all from Southern Italy, *globularis* (Ziegl.), *tiberiana* (Benoit), *paciniana* (Phil.), var. *major*, *provincialis* (Benoit), *eugenia* (Pfr.), = *calypso* (Benoit), with var. *huetina* (Benoit), all from Sicily, *globularis* var. n. *tarentina*, Tarento, *H. minoricensis* (Mittre) and *ebusitana* (Hidalgo), Balearic Islands; Kobelt, Iconogr. v. pp. 6-19, pls. cxxxiii. & cxxxiv.

Helix (Levantine) *guttata* (Oliv.), *dschulfensis* (Dubois), *escheriana* (Mouss.), *cæsareana* (Parr.), *michoniana* (Bourg.), *bellardii* (Mouss.), and *kurdistanica* (Parr.), Kobelt, Iconogr. v. pp. 1-16, pls. cxxi. & cxxii. *H. ghilanica* (Mouss.), *id. l. c.* p. 77, pl. cxi. fig. 1384.

[*Macularia*.] Full anatomical description of *Helix codringtoni* (Gray), var. *umbilicata*, *H. vermiculata* (Müll.), and *serpentina* (Lam.): all have the essential characters of *Pentatania* (Ad. Schmidt.), the two former very much resemble *H. alonensis* (Fér.), the third differs somewhat in the form of the arrow, which approaches that of *Campylaea*; F. Wiegmann, JB. mal. Ges. iv. pp. 195-213, pls. vi.-viii. Anatomical description of *H. alonensis*, jaw, radula, genital organs, arrow, intestine, and nervous ganglia, by H. Strebel. Verh. Ver. Hamb. iii. [1876] with 2 pls.

Helix coquandi (Morelet), Morocco and Southern Spain; Kobelt, Iconogr. v. p. 79, pl. cxi. fig. 1387.

Helix cossoni, sp. n., allied to *splendida* (Drap.), Lamalou-les-bains, Dep. Hérault, Lotourneux, R. Z. (3) v. p. 341.

[*Pomatia*] *Helix schleylii* (Mouss.), Epirus, *pomatia* var. *gesneri* (Hartm.), Switzerland, *pathetica* (Parr.), Asia Minor, *pomacella* (Parr.), both coasts of the Bosphorus, *taurica* (Kryn.), Crimea, *onixiomica* (Bourg.), Aleppo, *obtusalis* (Ziegl.), Southern Russia, *lutescens* (Ziegl.), Galicia and Transylvania, and *cavata* (Mouss.), Palestine; Kobelt, Iconogr. v. pp. 113-117, pls. cxlvii. & cxlviii.

Helix. Species from Siberia, Central Asia, and Japan.

Helix (*Patula*) *amblygona*, (*Vallonia*) *tenera*, and (*Fruticicola*) *verrucosa*, spp. nn., Reinhardt, JB. mal. Ges. iv. pp. 331 & 332, pl. xi. figs. 3-5, also SB. nat. Fr. 1877, pp. 69 & 95, Yeddo.

Helix (*Eulota*) *schrencki* (Midd.), Siberian varieties, *nordenskiöldi*,

sp. n., = *rufescens* of Schrenck (*nec* Penn.), Siberia, and (*Trichia sturbergi*, sp. n., = *sericea*, Schrenck (*nec* Drap.), both in Siberia, on the banks of the Yenissei and Tunguska, lat. 56–63° N., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 28–36, pl. i. figs. 1–3. *H. schrenckii* (Midd.), figured by Kobelt, Iconogr. v. p. 20, pl. cxxv. fig. 1196.

Helix rubens, var. n. *finschiana*, and *zeiliana*, found on the Ala-tau in Southern Siberia, at a height of 1900 mètres, by Dr. O. Finsch and Count Waldburg-Zeil. *H. semenovi* (Mart.) redescribed from specimens found on the banks of Ala-kul; Martens, SB. nat. Fr. 1877, pp. 240 & 241.

Helix stoliczkaniana (Nevill, MS.), sp. n., Martens, in Pfeiffer's Novitat. v. p. 37, pl. cxliii. figs. 9–13, Sasstekke, in a height of 6500 feet, Central Asia.

Helix lota (Gould), Hakodade, Martens, SB. nat. Fr. 1877, p. 102, and in Pfeiffer's Novitat. Conchol. v. p. 31, pl. cxliii. figs. 17–19.

Helix callizona (Crosse), several varieties from the western shores of Nippon, Japan; Martens, SB. nat. Fr. 1877, p. 103, and in Pfeiffer's Novitat. l. c. figs. 24–27.

Helix scavola, sp. n., Hakone mountains, Japan; Martens, SB. nat. Fr. 1877, p. 104, and in Pfeiffer's Novitat. l. c. p. 34, pl. cxliii. figs. 13–16.

Helix peliomphala (Fér.), different varieties and *blakeana* (Gould)?, from Japan; Martens, SB. nat. Fr. 1877, pp. 103 & 105.

Helix. Species from India :—

Helix (Plectotropis) tapeina (Bens.), var. n. *bhamoensis*, and *H. (P.) perplanata*, sp. n., Nevill, J. A. S. B., xlv. pt. 2, pp. 18 & 19, Bhamo and Upper Burmah, with notes on several other Indian species of this sub-genus.

Helix hemiopta (Bens.). Different varieties in colour; Martens, in Pfeiffer's Novitat. v. p. 37, pl. cxliii. figs. 1–8, Andaman Islands.

Sesara hungerfordiana, fig. 1, *inermis*, fig. 2, spp. nn., W. Theobald, J. A. S. B. xlv. pt. 2, p. 184, pl. xiv., River Salween, near Maulmoin.

Corasia [?] *bourdilloni*, sp. n., *id.* l. c. p. 185, pl. xiv. fig. 3, Travancore.

Gastrochus [?] *calcadensis*, Bedd., figured; *id.* l. c. pl. xiv. fig. 7.

Helix. Species from the Philippines :—

Dorcasia carinifera and *dissimilis*, spp. nn., Semper, Reis. Arch. Philippin. land-shells, pt. iv. pl. x. figs. 1–8, Philippines.

Chloraea antonii, sp. n., *id.* l. c. pl. x. fig. 10, Philippine Islands.

Hadra philipp[in]ensis, sp. n., *id.* l. c. pl. x. fig. 7, Philippine Islands.

Helix. African species :—

Helix schweinfurthi, sp. n., Martens, JB. mal. Ges. iv. p. 368, pl. xii. fig. 1, Plateau of Gebel-Galata, between the Nile and Red Sea, collected by G. Schweinfurth.

Helix alexandri (Gray), Pfeiffer's Novitat. v. p. 34, pl. cxliv. figs. 9–12, Damara, South Africa.

Helix africa (A. H. Brown), Pfeiffer, Chem. ed. nov. p. 527, pl. clxii. figs. 8 & 9, South Africa.

Helix corusca and *arachne*, spp. nn., Morelet, J. de Conch. xxv. p. 328 & 329, pl. xii. figs. 1 & 7. *H. russeola* (Morelet, 1851), *ibid.* pl. xiii. fig. 1, Anjoana, Comoro Islands.

Helix hova and *sukalava*, spp. nn., Madagascar, near *sepulchralis* (Fér.) and *subsepulchralis* (Crosse), all four figured, Angas, P. Z. S. 1877, pp. 803–805, pl. lxxx. figs. 1–11 [the second scarcely distinguishable from *lamarei*, Menke].

Helix watersi, *ekongensis*, and *balstoni*, Angas, P. Z. S. 1877, pp. 527 & 528, pl. liv. figs. 3–5; *H. funebris* and *cerina*, Morelet, J. de Conch. xxv. p. 217; *H. suarezensis*, Crosse & Fischer, J. de Conch. xxv. p. 78: spp. nn., all from Madagascar.

Helix. Species from Australia and Polynesia:—

Helix (Papuina) phaeostoma, sp. n., Martens, MB. Ak. Berl. 1877, p. 276, pl. i. figs. 10 & 11, and in Pfeiffer's Novitat. v. p. 32, pl. cxliv., figs. 13 & 14, New Hanover Island, near New Ireland.

Helix (P.) boivini (Petit), radula and genital organs similar to those of the group *Planispira*; Pfeiffer, MB. Ak. Berl. 1877, p. 277, pl. ii. figs. 11–13.

Helix textrix (Pfr.), Pfeiffer, Chemn. ed. nov. p. 528, pl. clxii. figs. 14–17, New Hebrides.

Helix elachystoma, sp. n., Martens, MB. Ak. Berl. 1877, p. 273, pl. i. figs. 8 & 9, and in Pfeiffer's Novitat. v. p. 35, pl. cxliv. figs. 1–4, Mermaidstreet, W. Australia. *H. convicta* (Cox), allied to the former, also from W. Australia; *id. ibid.* pl. i. figs. 6 & 7.

Helix colona, sp. n., *id.* MB. Ak. Berl. 1877, p. 272, pl. i. figs. 4 & 5, and in Pfeiffer's Novitat. v. p. 36, pl. cxliii. figs. 20–23, Daren Island, a small coral island between N.W. Australia and Timor. [*Rhagada*.]

Helix (Rhagada) kooringsensis, sp. n., Angas, P. Z. S. 1877, p. 33, with woodcut, 30 miles N.E. from the Burra Mines, South Australia.

Helix (Merope?) barnacki, sp. n., E. Smith, Ann. N. H. (4) xx. p. 242, Hawai, Sandwich Islands.

Helix. American species:—

Helix (Triodopsis) henriette, sp. n., Mazyck, P. Ac. Philad. 1877, p. 297, Texas.

Helix caeca (Guppy), Pfeiffer, Chemn. ed. nov. p. 539, pl. clxiii. figs. 26–28, Trinidad.

Helix (Microphysa) krugiana, sp. n., Martens, JB. mal. Ges. iv. p. 346, pl. xii. fig. 4, Porto Rico.

Helix (Thelidomus) angulifera, sp. n., *id. l. c.* p. 347, pl. xii. fig. 2, Porto Rico.

Helix arangiana, var. n. *semiaperta*, Martens, in Pfeiffer's Novitat. v. p. 33, pl. cxliv. figs. 15–18, Hayti (probably).

Helix (Isomeria) gealei, sp. n., E. Smith, P. Z. S. 1877, p. 361, pl. xxxix. fig. 9, South Ecuador.

Helix polygyratu (Born). Young specimens have several toothlike

plaits inside the shell at two or three spots in the seventh and eighth whorl; these are re-absorbed in full-grown specimens, but others similar are formed at one or two spots somewhat behind the aperture. Fischer, J. de Conch. xxv. pp. 263-267.

Cochlostyla. C. Semper admits this genus in a rather wide extent, comprising within it the subgenera or groups *Corasia*, *Callicochlias*, *Cochl. globosæ*, *C. hypomelænæ*, *C. cineræ* (type, *cryptica*, Brod.), *Azina*, *Helicostyla*, *Orustia*, *Cochl. sphericæ*, *Cochlodryas*, *Orthostylus*, *Cochl. elongatæ*, *Phengus*, *Eudoxus*, *Canistrum*, *Prochilus*, *Chrysallis*, and *Phenicoebius*; he enumerates 211 species living on the Philippine Islands. Reis. Arch. Phil., Land Moll. pt. 4, pp. 169-224.

Cochlostyla (*Corasia*) *magtanensis* and *limansauensis*, spp. nn., Semper, l. c. pp. 170 & 171, pl. x. fig. 11, pl. ix. fig. 6, Magtan Island, near Zebu, and Limansau Island, between Leyte and Mindanao.

Cochlostyla (*Callicochlias*) *samarensis*, sp. n., id. l. c. p. 119, pl. x. figs. 5 & 9, Samar.

Cochlostyla (sect. *globosæ*) *livido-cincta*, *erubescens*, and *pudibunda*, spp. nn., id. l. c. pp. 182 & 183, pl. ix. figs. 8 & 9, Luzon.

Cochlostyla (sect. *hypomelænæ*) *sphericæ*, var. n. *nana*, Leyte, and *C. dataensis* (Semper, 1866), North Luzon, id. l. c. pp. 185 & 186, the latter pl. viii. fig. 8.

Cochlostyla (sect. *elongatæ*) *elegans*, new name for *Bulimus signijorensis* (Pfr.), preoccupied in this genus; id. l. c. p. 210. *C. turris*, sp. n., id. l. c. p. 210, pl. ix. fig. 3, Luzon.

Cochlostyla (*Phengus*) *cinniniformis* (Sow.) and *virens* (Pfr.), very variable, id. l. c. p. 211.

Cochlostyla (*Eudoxus*) *smaragdina* (Sow.), variable in colour and form; id. l. c. pp. 213-216. *C. straminea*, Luzon, *paradoxa* and *oviformis*, Mindanao, spp. nn., id. l. c. pp. 216-218, pl. viii. fig. 10, pl. ix. fig. 5, pl. x. fig. 6.

Cochlostyla (*Prochilus*) *nigro-cincta*, new name for *Bulimus pan* (Pfr.), pre-occupied in this genus; id. l. c. p. 221. *C. sylvanoides*, sp. n., id. l. c. p. 222, pl. x. fig. 4, Mindoro.

Cochlostyla (*Chrysallis*) *antonii*, sp. n., id. l. c. p. 223, Mindoro.

Cochlostyla (sect. *cineræ*) *panaensis*, Panao, near Surigao, Mindanao, and *cineracea*, Mindanao, spp. nn., id. l. c. pp. 189 & 190, the latter pl. ix. fig. 1.

Cochlostyla (*Azina*) *pfeifferi*, new name for *Helix cumingi* (Pfr.), pre-occupied in this genus; id. l. c. p. 191.

Cochlostyla (*Helicostyla*) *montana*, sp. n., id. l. c. p. 194, pl. ix. fig. 4, Luzon.

Cochlostyla (*Orthostylus*) *grandis* (Pfr.), very variable in form; id. l. c. p. 240. *C. supra-badia*, *nux*, and *flammula*, spp. nn., id. l. c. pp. 201, 204, & 206, pl. ix. fig. 7, pl. x. fig. 2, North-east part of Luzon.

Radula of some Philippine species of *Cochlostyla*, *Chloræa*, and *Dorcasia*, figured; id. l. c. pl. xviii.

[*Amphidromus*] *Bulimus levus* (Müll.), from eastern part of Ceram; Martens, MB. Ak. Berl. 1877, p. 279.

Amphidromus theobaldianus, Bs., figured; W. Theobald, J. A. S. B. xlv. pt. 2, pl. xiv. fig. 8.

Bulinus (Eurytus) roseo-labrum, sp. n., E. Smith, P. Z. S. 1877, p. 362, pl. xxxix. fig. 8, South Ecuador.

[*Liparus*] *Bulinus ponsonbii*, sp. n., Angas, P. Z. S. 1877, p. 170, pl. xxvi. fig. 2, Western Australia.

Bulinus (Pachnodus) drakensbergensis, sp. n., E. Smith, Ann. N. H. (4) xx. p. 538, Transvaal.

[*B.*] *Buliminus olivaceus*, *tumidus*, and *obesa* [-us], spp. nn. (Gibbons, MS.), Taylor, Q. J. Conch. No. 12, pp. 253 & 254, pl. ii. figs. 3-5, Zanzibar. *B. gibbonsi*, Mozambique [*B. cinereus* is very near *conulinus*, Martens, 1869], *costatus*, *cinereus*, and *intermedius*, Zanzibar, spp. nn. (Gibbons, MS.), *id. l. c.* pp. 280-283, pl. iii. figs. 1, 2, 4, & 5.

[*Rhachis*] *Buliminus bewsheri*, sp. n., Morelet, J. de Conch. xxv. p. 330, pl. xii. fig. 4, Anjoana. *B. adumbratus* (Pfr.) and *venustus* (Morelet), *id. l. c.* pp. 332 & 333, pl. xiii. fig. 5, pl. xii. fig. 8.

Buliminus (Rhachis) pallens (Jonas), from Western Africa; Dohrn, Mal. Bl. xxiv. p. 158.

[*Petræus*] *Buliminus labrosus* (Oliv.), Syria and Palestine, *halepensis* (Fér.), Syria, *eremita* (Bens.), Turkestan, *attenuatus* (Mouss.) = *episomus* (Bourg.), Syria; Kobelt, Iconogr. v. pp. 61-63, pl. cxxxv.

[*Napæus*] *Buliminus athenensis* (Frivaldsky), Athos, *monticola* (Roth.), Parnassus, *grævus* (Beck), Taygetus, *kotschii* (Pfr.), Asia Minor and Mesopotamia; Kobelt, Iconogr. v. pp. 65-67, pl. cxxxvii. figs. 1345-1350 (the first also by the same in JB. mal. Ges. iv. p. 265, pl. v. fig. 5). [*N.*] *B. cefalonicus* (Mouss.), *id. l. c.* p. 70, pl. cxxxvii. figs. 1358 & 1359.

[*Zebrina*] *Buliminus detritus* (Müll.), varieties, *fusciolatus* (Oliv.), *var-nensis* (Frivaldsky), and *tauricus* (Lang), varieties; Kobelt, Iconogr. v. pp. 63-65, pl. cxxxvi. [*Z.*] *B. spoliatus* (Parr.), Morea, and *olympicus* (Parr.), Olympus, *id. l. c.* pp. 70 & 71, pl. cxxxvii. figs. 1360 & 1361; also JB. mal. Ges. iv. pp. 266-268, pl. v. figs. 6-8.

[*Chondrula*] *Buliminus pupa* (Brug.), var., *gastrum* (Ehrenb.), Syria, *tuberculatus* (Frauenf.), Syria, *pusio* (Brod.), Syria, *turgidus* (Parr.), Archipelago, *bayeri* (Parr.), Caucasus, *albo-limbatus* (Pfr.), Southern Russia, *brevior* (Mouss.), Armenia, and *carneolus* (Ziegl.), Constantinople; Kobelt, Iconogr. v. pp. 67-73, pl. cxxxvii. figs. 1351-1357, 1362-1365.

Hapalus travancoricus, Th., redescribed and figured; it is not the young state of *Catulaus calcadensis*. W. Theobald, J. A. S. B. xlv. pt. 2, p. 186, pl. xiv. fig. 5.

Achatinella. G. Pfeffer describes the genital organs of *A. vulpina* (Fér.), and compares them with the descriptions given by G. Binney (Ann. Lyc. N. York) of other species; the differences are apparently great, but a great part of them can be explained by the suggestion that Binney's specimen was somewhat injured. JB. mal. Ges. iv. pp. 330-331, with woodcut.

Glessula blanfordiana, sp. n., Nevill, J. A. S. B. xlv. pt. 2, p. 26, Yunnan.

[*Glessula* ?] *Achatina cornea*, sp. n., Morelet, J. de Conch. xxv. p. 335, pl. xiii. fig. 9, Anjoana, Comoro Islands.

Leptinaria (Beck). History of the genus discussed, viviparity confirmed, and geographical distribution limited to tropical America, the Polynesian *Tornatellinae* excluded; Fischer & Crosse, Moll. terr. et fluv.

de Méxique, vi. pp. 620-624. *L. lumellata* (Potiez & Mich.): radula figured; pl. xxviii. figs. 8-10. *L. elise* (Tristram) perhaps = *Spiraxis guatemalensis* (Crosse); p. 624.

Ferussacia vescoi (Bourg.) = *folliculus* (Gronov.); Morelet, J. de Conch. xxv. p. 248.

Lovea wollastoni, new name for the Madeiran shell hitherto regarded as identical with the South-European *Achatina folliculus* (Gronov.), and the living animal described; R. Watson, P. Z. S. 1877, pp. 333 & 334 [cf. Zool. Rec. xii. p. 189].

Bulimus goodalli (Fér.) [*Azeca menkeana*, Pfr.], feeds on worms; Daniels, Q. J. Conch. No. 12, p. 246.

Azeca mabilleana, sp. n., Fagot, Moll. des Hautes-Pyrénées; J. de Conch. xxv. p. 312, not sufficiently described, Lourdes.

Cryptazeca, g. n., near *Azeca*. Foot truncated behind, with a mucous pore; mantle not reflected on the edge of the aperture. *C. monodonta*, sp. n. Folin & Berillon, J. de Conch. xxv. p. 397.

Cecilianella (Bourg.). The history of the genus discussed, and *C. veracruzensis*, sp. n., = *Ach. iota*, Strebel (nec C. B. Ad.), described; Fischer & Crosse, Moll. terr. et. fluv. de Méxique, pp. 585-592, pl. xxvi. fig. 4. The new species is also described by them in J. de Conch. xxv. p. 273, from Vera Cruz.

Stenogyra. P. Fischer & H. Crosse establish a new family *Stenogyridæ*, characterizing it by the very small median tooth of the radula, the thin, feebly arcuated jaw, and the turriculate uniformly coloured shell, the two first whorls being quite smooth; to include the following genera:—*Cecilianella*, *Azeca*, *Ferussacia*, *Lovea*, *Opeas*, *Rumina*, *Stenogyra*, restrict. = *Obeliscus* (Beck), *Pseudobalea*, *Melaniella*, *Spiraxis*, *Lep tinaria*, *Subulina*, and *Glessula*. Moll. terr. et fluv. de Méxique, vi. pp. 581-585.

Bulimus balstoni, sp. n., Angas, P. Z. S. 1877, p. 527, pl. liv. fig. 7, Ekongo, S. E. Madagascar. [Near *Stenogyra obtusata* (Gm.), and bearing a remarkable likeness to *Spiraxis eximius* (Shuttl.).]

Opeas (Albers) established as a distinct genus, and the following species described:—*O. costato-striatus* (Pfr.), Mexico and Guatemala, *caracasensis* (Rv.), Mexico and West Indies, *subula* (Pfr.), Mexico, Central America, West Indies, and Cochin China, *bocourtianus* (Crosse & Fischer, 1869), Guatemala, *colimensis* (id., 1869), Mexico, and *gladiolus*, sp. n., Guatemala; Crosse & Fischer, Moll. terr. et fluv. de Méxique, vi. pp. 592-604, pl. xxvi. figs. 5-10, the last also J. de Conch. xxv. p. 272.

Opeas delicata, sp. n. (Gibbons, MS.), Taylor, Q. J. Conch. No. 13, p. 281, pl. iii. fig. 3, Zanzibar.

[*Opeas*] *Bulimus* (*Stenogyra*) *johanninus*, sp. n., Morelet, J. de Conch. xxv. p. 333, pl. xii. fig. 3, Anjoana, Comoro Islands.

Subulina octona (Chemn.). Living animal, eggs, jaw, and radula figured by Crosse & Fischer, l. c. pl. xxviii. figs. 1-7, *S. berendti* (Pfr.), *chiapensis* (Pfr.), and *sargi* (infra), shells figured, *ibid.*, pl. xxvi. figs. 1-3.

Subulina sargi, sp. n., Crosse & Fischer, J. de Conch. xxv. p. 272, Coban in Guatemala.

Subulina intermedia, sp. n. (Gibbons MS.), Taylor, Q. J. Conch. No. 13, p. 282, pl. iii. fig. 5, Zanzibar.

Spiraxis (O. B. Ad.). History of the genus discussed, and the following species described; (A) *tortoplicata*: *scaliariopsis* (Mor.), Guatemala, *sulciferus* (Mor.), Guatemala and Mexico, *euptyctus* (Pfr.), Chiapas, *berendti* (Pfr.), *tenuis* (Pfr.), *acus* (Shuttl.), *linearis* (Pfr.), *blandi*, sp. n., all from Mexico; (B) *dentato-plicata*: *mexicanus* (Pfr.), *guatemalensis*, sp. n., Guatemala, and *martensi* (Pfr.), Mexico. Fischer & Crosse, Moll. terr. et fluv. de Méxique, vi. pp. 604-620, pl. xxv. figs. 1-11. The two new species also in J. de Conch. xxv. p. 127.

Clausilia. Monograph continued and finished by Sowerby in Reeve's Conch. Icon. pts. 338 & 339, pl. x. spec. & fig. 86, to pl. xvii. spec. & fig. 165; *distantilirata* is apparently new, fig. 160, and *oblita*, doubtful species, fig. 9, localities unknown. [Quotations of foreign authors often misspelt, e.g., Zeigler instead of Ziegler, Fussendorf instead of Fuss, sp. 127, Martini instead of Martens, sp. 119, &c.]

Clausilia. O. Böttger, having examined the fossil and many recent species, gives a new arrangement of the subdivisions as follows:—

- Sect. 1. *Balea* (Prid.), *C. tristensis* (Leach), and *perversa* (L.), Europe, Tristan d'Acunha, New Zealand.
2. *Reinia* (Kobelt), *variegata* (A. Ad.), Japan.
3. *Triptychia* (Sandb.), *C. antiqua* (Schübl.), only fossil species, miocene, and a few pliocene.
4. *Alopiia* (H. & A. Ad.), *C. guicciardi* (Heldr.) and *livida* (Mke.), Attica and Transsylvania.
5. *Eualopia* (n.), *C. bulimoides* (A. Braun), only fossil species, miocene.
6. *Triloba* (Vest), *C. sandrii* (Küst.), and *macedonica* (Rossm.), Montenegro and Macedonia.
7. *Marpessa* (Moq. Tand., emend.), *C. transiens* (Möllend.) and *laminata* (Mont.), Europe.
8. *Herilla* (H. & A. Ad., emend.), cf. *frivaldskiana* (Rossm.), and *davica* (Friv.), European Turkey, Servia, and Dalmatia.
9. *Siciliaria* (Vest), *C. septemPLICATA* (Phil.), and *crassicosata*, (Ben.), Sicily.
10. *Delima* (Hartm., emend.), *C. gibbula* (Ziegl.), *stigmatica* (Ziegl.), *piceata* (Ziegl.), *itala* (Mart.), *stentzi* (Rossm.), *conspurcata* (Jan.), *binodata* (Ziegl.), *lavissima* (Ziegl.), *cattaroensis* (Ziegl.), *substricta* (Parr.), *robusta* (Küst.), and *semirugata* (Küst.), Dalmatia, South-eastern parts of the Alps, Italy.
11. *Medora* (H. & A. Ad., emend.), *C. macarana* (Ziegl.), Dalmatia, Carniola, Calabria.
12. *Agathylla* (H. & A. Ad., emend.), *C. exarata* (Ziegl.), Dalmatia, Bosnia.
13. *Constricta* (n.), *C. tenuisculpta* (Reuss), all miocene species.
14. *Cristalaria* (Vest), *C. strangulata* (Fér.), Syria, Palestine, Crete, Macedonia.

Sect. 15. *Albinaria* (Vest), *C. cœrulea* (Fér.), Greece and its islands, Asia Minor.

16. *Carinigera* (Möllend.), *C. eximia* (Möllend.), Servia.
17. *Papillifera* (Hartm., emend.), *C. lumpedusæ* (Calc.), *isabellina* (Pfr.), *venusta* (A. Schm.), *græca* (Pfr.), *leucostigma* (Ziegl.), *saxicola* (Parr.), *solida* (Drap.), and *bidens* (L.), Italy and Greece.
18. *Dilataria* (Vest), *C. tenuilabris* (Rossm.), *succineata* (Ziegl.), and *diodon* (Stud.), Austrian provinces and Piedmont.
19. *Phædusa* (H. & A. Ad.), *C. shanghaiensis* (Pfr.), *valida* (Pfr.), *yokohamensis* (Grosse), *swinhoei* (Pfr.), *philippiana* (Pfr.), *cornea* (Phil.), *cylindrica* (Gray), and *pluviatilis* (Bens.), Eastern Asia.
20. *Serrulina* (Mouss.), *C. serrulata* (Midd.), and *filosa* (Mouss.), Transcaucasia.
21. *Fusulus* (Vest), *C. interrupta* (Ziegl.), and *varians* (Ziegl.), S. E. Germany.
22. *Pseudolinda* (n.), *C. fallax* (Rossm.), and *mirabilis* (Parr.), Transsylvania and Asia Minor.
23. *Uncinaria* (Vest), *turgida* (Ziegl.), Transsylvania and Bukowina.
24. *Mentissoidea* (n.), *C. fusorium* (Mouss.), Transsylvania.
25. *Mentissa* (H. & A. Ad., emend.), *C. gracilicosta* (Ziegl.), Crimea.
26. *Emarginaria* (n.), *C. schæfferiana*, sp. n., miocene.
27. *Canalicia* (Böttg., 1863), *C. articulata* (Sandb.), all species miocene.
28. *Euxina* (n.), *C. duboisi* (Charp.), *schwerzenbachi* (Parr.), *strumosa* (Friv.), *acuminata* (Mouss.), *hetara* (Friv.), *huebneri* (Rossm.), *sandbergeri* (Mouss.), *somchetica* (Pfr.), and *mæsta* (Fér.), Crimea, Transcaucasia, Asia Minor, Syria.
29. *Alinda* (H. & A. Ad., emend.), *C. buplicata* (Mont.), *plicata* (Drap.), and *index* (Mouss.), and Transcaucasia.
30. *Strigillaria* (Vest), *C. cana* (Held.), Germany and S.E. Europe.
31. *Pseudidyla* (n.), *C. marsingensis* (Sandb.), only two miocene species.
32. *Idyla* (H. & A. Ad., emend.), *C. pagana* (Ziegl.), *bitorquata* (Friv.), and *varnensis* (Pfr.), S.E. Europe and Syria.
33. *Oligoptychia* (n.), *C. levicollis* (Parr.), *foveicollis* (Parr.), and *pikermiana* (Roth), Greece, Transcaucasia, Asia Minor, and Syria.
34. *Pirotoma* (Vest, emend.), *C. bergeri* (Meyer), *rugosa* (Drap.), *plicatula* (Drap.), and *ventricosa* (Drap.), Europe.
35. *Laminifera* (Böttg., 1863), *C. pauli* (Mabille), Pyrenees, and *rhombostoma* (Böttg.), miocene, and one oligocene species.
36. *Nenia* (H. & A. Ad.), *C. blandiana* (Pfr.), *cyclostoma* (Pfr.), *tridens* (Chemn.), *bartletti* (H. Ad.), *perarata* (Martens),

and *bourcierii* (Pfr.), New Granada, Ecuador, Peru, and Porto Rico.

Sect. 37. *Disjunctaria* (n.), *C. oligogyra*, sp. n., eocene.

38. *Macroptychia* (n.), *C. sennaariensis* (Pfr.), N.E. Africa.

39. *Böttgeria* (Heynem., 1861), *C. crispa* (Lowe), and *deltostoma* (Lowe), Madeira.

40. *Olympia* (Vest), *C. olympica* (Friv.), Mount Olympus.

Many of these sections are subdivided into several distinct groups, most of them designated with the name of the typical species; these species are mentioned above in their section. All known species are enumerated, and some new described. Clausilien-studien, 120 pp.

Clausilia biplicata (Mont.) var. n. *nelsoni* (Joffr.), Taylor, Q. J. Conch. No. 11, p. 216, Hammersmith.

J. R. Bourguignat, Ann. Sci. Nat. (6) v. art. 4, reviews the species of *Clausilia* found in France, describing the following as new:—

C. mongermonti, St. Jean de Maurienne in Savoy, resembling in habits and aspect *Pupa cinerea*, and forming a special group, p. 5.

Group of *C. papillaris* and *solida*: *C. herculaea*, Monaco, *marioniana*, Marseilles, *argæensis*, Hyères Islands, *enhalia*, Cannes, Antibes, Nice, and Monaco, *sancti-honorati*, Cannes, Dep. Alpes Maritimes, pp. 6-14.

Group of *laminata*: *C. plagiotoma*, Troyes, *silanica*, Lake Silan, Dep. Ain, *sequanica*, Nogent-sur-Seine, *emeria*, Vallée du Guil, Hautes-Alpes, pp. 15-20.

Group of *punctata* (Mich.): *C. veranii* and *virinata*, Alpes Maritimes, on rocks, pp. 23 & 24.

Group of *ventricosa* and *rolphi*: *C. micropleurus*, Dep. Ain, Aube, and Aisne, *earina*, Valley of the Rhone, *carthusiana*, near Grande Chartreuse, Dep. Isère, *oniziomica*, Dep. Sarthe and Hautes-Pyrénées, *digonostoma*, Bagnères de Luchon, Haute-Garonne, pp. 25-34.

Group of *plicatula*: *C. milne-edwardsi*, Ensisheim, Alsace, *matronica*, Jaulgonne, Dep. Aisne, *sabaudina*, Aix-les-Bains, Savoy, *leia* [-lia], Alpes Maritimes, pp. 35-44.

Group of *plicata* and *biplicata*: *C. gibbosa*, Neu Breisach, Alsace, *plagia*, Alsace and Lucerne, *alasthena*, Jura, near Pontarlier and Lucerne, pp. 44-50.

Clausilia laminata var. n. *triloba*, Carniolia and Croatia, *pelagosana*, Pelagosa Island in the Adriatic, as subspecies of *gibbula* (Z.), *stossichi*, Dalmatia, *sulcosa* var. n. *atractoides*, Dalmatia, *albicosta*, Macedonia, *dextrorsa*, Macedonia, *perplexa*, Macedonia, *pirostoma*, Croatia, *perlucens*, Caucasus, *ossetica* (Bayer, nec Parr.), *unicristata*, Transcaucasia, all new species or varieties; Böttger, Nachr. mal. Ges. 1877, pp. 65-70 & 74-76. The same and *C. cognata*, Dalmatia, and *ravicosta*, Croatia, spp. nn., described by the same in Clausilien-studien, pp. 31, 34, 38, 40, 46, 52, 69, 85, & 94. *C. incerta* (Benoit) and its difference from *stigmatica* (Ziegl.); id. l. c. p. 34.

Clausilia itala (Mart.). The numerous varieties are arranged by

P. Strobel as follows :—var. i. *major*, subvar. 1, *lævis* = *itala*, s. str., *mut. ventricosa* = *brauni* (Charp.), subvar. 2, *subrugata* (Mke.), 3, *rugata* (Ziegl.); var. ii. *media* = *albo-pustulata* (Crist.) = *albo-guttulata* var. *italica* (Pfr.), subvar. 1, *lævis* = *albo-pustulata*, st. str., *mut. a pallidior* = (*diluta*, Ziegl.), b = *rubiginea* (Ziegl.), subvar. 2, *striata* = *punctata* (Mich.), 3, *rugata* = *late-striata* (Charp.), 4, *costulata* = *baldensis* (Parr.); var. iii. *minor* = *ornata* (Ziegl.). Bull. Soc. mal. Ital. iii. pp. 99 & 100.

Clausilia adami, sp. n., Clessin, JB. mal. Ges. iv. p. 293; description translated into Italian by Adami, Bull. Soc. mal. Ital. iii. pp. 65–67, Cortona in Umbria, Italy.

Clausilia lucensis (Gentiluomo) at the baths of Lucca: Paulucci, Bull. Soc. mal. Ital. iii. pp. 9–12.

Clausilia punctulata (Küst.) = *orsiniana* (Villa, not described), Monte Sibilla (Piceno) and Calabria, belongs to the section *Medora*; id. l. c. pp. 68–70.

Clausilia aurigerana, sp. n. (not described), Fagot, Moll. d. Hautes-Pyrénées, Bigorre.

Clausilia lamalouensis, sp. n., Letourneux, R. Z. (3) 1877, p. 346, near *parvula* (Stud.), Lamalou-les-bains, dep. Hérault.

Clausilia hilgendorfi, *eurystoma*, *nodulifera*, *brevior*, *platyauchen*, *hyperolia*, and *decussata*, spp. nn., mountains of Japan, and notes on *reimiana* (Kobelt), *japonica* (Crosse), *proba* (A. Ad.); Martens, SB. nat. Fr. 1877, Apr. pp. 106–111.

Clausilia tau, *strictaluna*, *hickonis*, spp. nn., Japan, and *ptychochila*, sp. n., China, Böttger, Nachr. mal. Ges. 1877 (Aug.), pp. 70–73. The same, and *C. subgibbera*, *expansilabris*, *digonoptyx*, *vasta*, *viridiflava*, and *atrata*, spp. nn., *platydera* (Martens), var. n. *lambda*, and *validiuscula* (Martens), var. n. *bilamellata*, all from Japan, described; id. Clausilienstudien, pp. 57–59, 62, 65–68. *C. aculus* (Bens. P., Martens), from Korea and Nagasaki; id. l. c. p. 59.

Nenia (H. & A. Adams). Bourguignat enumerates and describes the known species, all South American, also *N. cyclostoma* (Pfr.), which has been wrongly indicated as originating from Korea, and establishing a new species. *N. pseudepistomium* for *Clausilia epistomium* var., Pfeiffer, Novitat. Conch. pl. xxii. figs. 1–3. He also refers to this genus two species living in the Pyrenees, *Clausilia pauli* (Mabille, 1865) and *N. mabilli*, sp. n.; they form a distinct section of the genus, *Neniatlanta*, characterized by the peristome being feeble, and the under lamella parallel to the upper. Ann. Sci. Nat. (6) iv. 1876, art. 10, 29 pp.

Pupa: Young specimens of *doliolum* have curious angulated and noduliferous plaits on the roof of the aperture, which are re-absorbed in the adult; with notes on the natural groups of this genus and importance of studying young shells. Reinhardt, JB. mal. Ges. iv. pp. 278–283, 286, & 287.

Pupa interrupta, *clavella*, and *salurnensis*, spp. nn., the two former from Borschom, in Transcaucasia, the last from Salurn, in Southern Tirol, *P. triplicata* (Stud.), varr. nn. *luxurians* and *inops*, with critical notes concerning *P. bifilaris* (Mouss.) and *strobeli* (Gredl.); Reinhardt, JB. mal. Ges. iv. pp. 76–87, pl. iii. figs. 1–7.

Pupa ressmanni (Villa) = *biplicata*, var. *excessiva* (Gredl.) ; Gredler, Nachr. mal. Ges. 1877, p. 4.

Pupa tschapecki, sp. n., *id. l. c.* pp. 4-6, Peggau, in Styria, near P. pagodula.

Pupa muscorum (Müll.), var. n. *lundstræmi*, and *arctica* (Wallenb.), var. n. *extima*, Siberia, at the Yenissei, lat. 64° N., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 41 & 42.

Pupa dilucida (Ziegl.) found in France at Barbotan, dep. Gers ; shell and living animal described by Dupuy, J. de Conch. xxv. p. 19.

Pupa kratiki, sp. n., Letourneux, R. Z. (3) v. p. 348, Lamalou-les-Bains, dep. Hérault.

Pupa theeli and *inermis*, spp. nn., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 102 & 103, Mikoulina and Seliwarinskoje, Siberia.

Pupa minuscula, sp. n., Morelet, J. de Conch. xxiv. p. 340, pl. xii. fig. 5, Anjoana, Comoro Islands.

Pupa (*Leucochila* ?) *armigerella*, sp. n., Reinhardt, SB. nat. Fr. 1877, p. 96, and JB. mal. Ges. iv. p. 323, pl. xi. fig. 7, Misaki, Japan.

Vertigo moulinsiana (Dupuy) found in Lombardy ; Pini, Atti Soc. Ital. xix. [1876] p. 493. Also in England ; Q. J. Conch. No. 12, p. 230, Ann. N. H. (4) xix. p. 432. On its synonymy ; Jeffreys, Ann. N. H. (4) xix. p. 432.

Pupa (*Vertigo*) *heldi*, sp. n., Clessin, Nachr. mal. Ges. 1877, p. 49, alluvial lands of the Danube near Regensburg.

Pupa (*Vertigo*) *hydrophila* and (*Leucochila* ?) *armigerella*, spp. nn., Reinhardt, JB. mal. Ges. iv. p. 323, pl. xi. figs. 6 & 7, also SB. nat. Fr. 1877, p. 86, Hakodadi and Misaki, in Japan.

Zospeum (Bourg.). See *Auriculide*.

GONIOGNATHA.

Liguus virgineus (Müll.). The variations in number and colour of the bands, and certain limits in their position and distribution, are examined ; the dark green and the pale violet bands pass into each other, as do the black and dark red ; five zones of intensely coloured bands can be kept distinct, some of them containing two bands ; the pale yellow bands are situated between these zones, &c. The animal has been found on trees of Campeachy-wood, which yields similar colours. Martens, JB. mal. Ges. iv. pp. 362-367.

Bulimulus virgulatus (Fér.). Varieties in colour ; *id. l. c.* p. 350.

Bulimus (*Drymaeus*) *ochrochilus*, *aequatorianus*, *albo-labiatus*, and *orthostoma*, spp. nn., E. Smith, P. Z. S. 1877, pp. 362-364, pl. xxxix. figs. 1, 4, 5, & 7, South Ecuador.

Bulimus (*Liostracus*) *subpellucidus*, *flavidulus*, and *fusco-labris*, spp. nn., *id. l. c.* pp. 364 & 365, pl. xxix. figs. 2, 3, & 6, South Ecuador, the third from Tarapoto, Andes of Peru.

Bulimulus (*Leptomerus*) *corneus* (Sow.), Guatemala, *istapensis* (Cr. & Fisch.), Guatemala, *inermis* (Mor.), Yucatan, *dysoni* (Pfr.), Honduras, Guatemala, and Yucatan, *coriaceus* (Pfr.), Mexico, *petenensis* (Mor.), Guatemala, *berendti* (Pfr.), Mexico, Belize, and Nicaragua, *semistriatus*

(Mor.), Chiapas, *nubeculatus* (Pfr.), Mexico; Fischer & Crosse, Moll. terr. et fluv. de Méxique, vi. pp. 548-556, some figured on pls. xx., xxi., & xxiv. of the preceding part.

Bulimulus (*Peronæus*) *artemisia* (Binn.), St. Lucas, California; *iid.* l. c. p. 557, pl. xxi. fig. 12.

Bulimulus (*Leptobysrus*) *spirifer* (Gabb), Mexican part of California; *iid.* l. c. p. 558, pl. xx. figs. 26 & 27.

Bulimulus (*Thaumastus*) *alternatus* (Say), *schiedeanus* (Pfr.), *tryoni*, new name for *mexicanus* (Rv., nec Lam.), Mexico, and *dealbatus* (Say), United States, perhaps also in Mexico; *iid.* l. c. pp. 561-568.

Bulimulus (*Globulinus*) *sufflatus* (Gould) = *juarezi* (Pfr.), and *pilula* (Binn.), Mexican part of California; *iid.* l. c. pp. 568-571, pls. xx. & xxi. of the preceding part.

Bulimulus (*Scutalus*) *stelnzeri*, sp. n., Dohrn, Mal. Bl. xxiv. p. 157, Cerro de Chepe, Argentine States.

Bulimulus (*Eudiotus*) *psidii*, sp. n., Martens, JB. mal. Ges. iv. p. 351, pl. xii. fig. 6, Porto Rico.

[*Nesiotes*] *Bulimus* *nux* (Brod.) and *eschariferus* (Sow. : specimens from Charles Island, Galapagos; E. Smith, P. Z. S. 1877, p. 72.

Macroceramus *shuttleworthi*, sp. n. (= *microdon* var., Shuttleworth & Pfr., in Chemn. ed. nov. pl. xlii. figs. 7 & 8), Martens, JB. mal. Ges. iv. p. 352, Porto Rico.

Cylindrella (Pfr.) Monograph continued by Sowerby in Reeve's Conchologia Iconica, pts. 336-339, from pl. ix. spec. & fig. 74 until pl. xvi. spec. & fig. 144, apparently new. *C. transaperta*, sp. n., fig. 77, *multispiralis*, sp. n., fig. 79, *trochæfermis* [!], sp. n., fig. 80, *intermedia*, sp. n., fig. 91, *bulbiformis*, sp. n., fig. 103, localities of all unknown, *lucens* (Wright), fig. 135, Cuba. *C. aristispica* (Pfr.), sp. 5, is an erroneous spelling of *arctispira* [P. Z. S. 1860].

Simpulopsis. Fischer & Crosse discuss at length the history and systematic place of this genus, placing it near *Bulimulus*, and describe *S. simula* (Morelet), from Guatemala, and *anea* (Pfr.), from Mexico. Moll. terr. et fluv. de Méxique, pp. 571-580, pl. xxiv. figs. 12 & 13.

Amphibulima *patula* (Brug.) lives under leaves, chiefly of plantains (*Musa*), and is found only in one district of the island Marie-Galante. Mazé, J. de Conch. xxv. pp. 347 & 348.

ELASMOGNATHA.

Succinea. Genital organs examined; the male and female orifices are separated as in the *Limnæidæ*, the rest agreeing with the *Helicidæ*; the seminal vesicles are more easy to make out than in any other genus of land-shells. H. v. Ihering, JB. mal. Ges. iv. pp. 136-141, with woodcut.

Succinea. A. Baudon gives some general notes on this genus, and distinguishes 10 species living in France, placing them in three groups corresponding to the three generally admitted species, *putris* (L.), *elegans* (Risso) or *pfeifferi* (Rossm.), and *oblonga* (Drap.). J. de Conch. xxv. pp. 57-69. He admits the following species:—

First group.—Jaw horny: *putris* (L.), *parvula* (Pascal), pl. vii. fig. 1, *baudoni* (Drouet, MS.), sp. n., pl. vii. fig. 2, *acrambleia* (Mabille), sp. n., pl. vii. fig. 4, both in different parts of middle France.

Second group.—*S. pfeifferi* (Rossm.), with 9 varieties, including *mortilleti* (Stabilo), *ochracea* (de Betta), and *thermalis* (Boubée), also *S. elegans* (Risso), including as varieties *longiscuta* (Morelot) and *corsica* (Shuttl.); *S. debilis* (Morelet). In the last the jaw is corneo-membranaceous, in the two others horny.

Third group.—Jaw membranaceous: *S. arenaria* (Bouchard), *humilis* (Drouet), and *oblonga* (Drap.), with two varieties.

All these are fully described and compared, and the shells and jaws figured; J. de Conch. xxv. pp. 128-198 & 227, pls. vi.-x.

Succinea putris (L.) and *pfeifferi* (Rossm.). Schepman maintains these as distinct species, from constant differences in the jaw, which has lateral projections in the former and none in the latter, and in the genital organs. Tijdschr. Ned. Dierk. Ver. ii. (1877, pt. 4).

Succinea crosseana and *breviuscula*, spp. nn., Baudon, J. de Conch. xxv. pp. 348 & 351, pl. xi. figs. 1 & 2, Villefranche, Southern France, both near *arenaria*. Notes on the jaw of *elegans* (Risso) and *acrambleia*, by the same, *ibid.* pp. 354 & 355.

Succinea horticola, sp. n., Reinhardt, JB. mal. Ges. iv. p. 321, pl. xi. fig. 2, and SB. nat. Fr. 1877, p. 95, Yeddo.

Succinea nevillei, sp. n., Morelet, J. de Conch. xxv. p. 328, pl. xii. fig. 2, Anjoana, Comoro Islands.

Succinea californica, sp. n., jaw and radula figured by Fischer & Crosse, Moll. terr. et fluv. de Méxique, pl. xxviii. figs. 18-20; shell, pl. xxvii. fig. 9. *S. guatemalensis*, *hortulana*, *recisa* (Morelet), *brevis* (Dkr.), *pueblensis* (sp. n.), *aurea* (Lea), *luteola* (Gould), *virgata* (Martens), *undulata* and *concordialis* (Gould): shells figured; *ibid.* pl. xxvi. figs. 11-15, pl. xxvii. figs. 1-8 & 10. *S. pueblensis*, described; *ibid.* J. de Conch. xxv. p. 273, Puebla, Mexico.

Succinea bettii, sp. n., E. Smith, P. Z. S. 1877, p. 72, pl. xi. fig. 8, Charles Island, Galapagos.

Parmarion kersteni (Martens), anatomically examined by G. Pfeffer; jaw as in the *Elasmognatha*, teeth of the radula rather simple, no caudal gland. JB. mal. Ges. iv. pp. 325-329, with woodcut. [It must consequently be removed from the genus *Parmarion*.]

AURICULIDÆ.

Auricula. Monograph by Sowerby in Reeve's *Conchologia Iconica*, containing 63 species.

[*Carychium*.] G. Schacko states that the radula of *C. obesum*, *lautum*, *schmidtii* (Frauenf.), and *frauenfeldi* (Freyer) has decidedly the character of the radula of the *Auriculida*, the hook and neck of each tooth diverging in a distinct angle from the median line. The presence of 4 feelers with eyes on the tip has been stated by Ullepitsch, but the species in which this observation was made is not specified. New observations are

therefore needed before it can be determined which of those cavern shells, called *Zospeum* by Bourguignat, belong to the *Helicidae*. SB. nat. Fr. 1877, pp. 201-203.

Carychium noduliferum, sp. n., Reinhardt, JB. mal. Ges. iv. p. 324, pl. xi. fig. 8; also SB. nat. Fr. 1877, p. 97, Misaki, Japan.

Marinula maindroni, sp. n., and *nigra* (Phil.), var. *n. minor*, Vélain, Arch. Z. expér. vi. pp. 125 & 126, pl. iv. figs. 25 & 26, St. Paul and Amsterdam Islands.

Melampus corticinus, sp. n., Morelet, J. de Conch. xxv. p. 216, Mauritius.

LIMNÆIDÆ.

A. PAULY has studied the respiration of the *Limnæidæ* [see Zool. Rec. xii. p. 193, xiii. Moll. p. 51], and, from numerous observations and experiments, comes to the following conclusions: the *Limnæidæ*, under natural conditions, come at intervals to the surface of the water in order to breathe air; these intervals vary from a few minutes to several hours, chiefly according to the facility of reaching the surface by creeping. Under water, the pulmonary orifice is kept closed, and is not extended by water; only very young snails have it open and filled with water, and this only before they begin to breathe air. If bubbles of air are present, as in shallow ponds containing many water-plants, or in an aquarium, the *Limnæidæ* make use of these bubbles for their respiration. Adult specimens kept from air can survive for 90 days, but they respire only by the skin, and never use the pulmonary sac as a water-respiring organ. But as the young snails, in the egg and some time after being hatched, receive water in their pulmonary orifice, it is possible that those which live at a considerable depth may retain this sort of respiration during their whole life, together with respiration by the skin. Ueber die Wasserathmung der Limnæiden, 47 pp.

S. Clessin thinks that the *Limnæidæ* normally respire water, and that they are compelled to come to the surface and respire air only by unusually high temperature. Mal. Bl. xxiv. pp. 175 & 176.

Limnæa. Numerous varieties of the European species discussed and figured by Kobelt, Iconogr. v. pp. 32-46, and pp. 117-123, pls. cxxviii.-cxxx., cxlix., & cl.

Limnæa profunda, sp. n., = *stagnalis* var. (Brot), *L. abyssicola* (Brot), and *foreli*, sp. n., Clessin, Mal. Bl. xxiv. pp. 171 & 172, pl. iii. figs. 2-4, 8 & 9, depths of the Lake of Geneva, corresponding to *L. stagnalis*, *palustris*, and *auricularia*.

Limnæa peregra (Müll.), var. *n. albida*, Lister Peace, Q. J. Conch. No. 10, p. 174, Askern.

Limnæa limosa (L.), keeled deformity, from Edinburgh, Piervos, Proc. verb. Soc. mal. Belg. vi. p. 47, with woodcut.

Limnæa acutalis (Morelet). Note on it by the author; J. de Conch. xxv. p. 249, Portugal.

Limnæa andersoniana and *yunnanensis*, spp. nn., Nevill, J. A. S. B. xlv. pt. 2, p. 26, Yunnan, the first at 4000 feet, and also found at Kashgar; very near *pervia* (Martens).

Physa (Aplexa) hypnorum, var. n. *polaris*, Siberia, at the Yenissei, lat. 71° N., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, p. 57, pl. i. fig. 12.

Aplecta spiculata (Morelet), Fischer & Crosse, Moll. terr. et fluv. de Méxique, vi. pl. xxvii. fig. 13.

Physa ? *ænigma*, sp. n., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, p. 104, Siberia, Yenissei.

Physa nyassana and *succinoides*, spp. nn., E. Smith, P. Z. S. 1877, pp. 717 & 718, pl. lxxv. figs. 16–20, Lake Nyassa.

Physa madagascariensis, sp. n., Angas, P. Z. S. 1877, p. 528, pl. liv. fig. 2, Madagascar.

Physa tehuantepecensis, sp. n., and *berendti* (Dkr.), figured; Fischer & Crosse, Moll. terr. et fluv. de Méxique, vi. pl. xxvii. figs. 14 & 15.

Physa (Isidora) ? sibirica, sp. n., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, p. 56, pl. i. fig. 13, Siberia at the Yenissei, lat. 71° N.

Planorbis. The embryonal shell is distinctly sinistral; Fischer, J. de Conch. xxv. pp. 198–200, pl. iv. fig. 6.

Planorbis. Sowerby begins the monograph of this genus in Reeve's Conch. Icon., pts. 232 & 233, 234 & 235, 14 pls., 123 species and figures. The following are apparently new: *P. succinus*, sp. n., fig. 19, *coarctatus*, fig. 21, *declivis*, fig. 25, *eburneus* (Gray), fig. 38, Ceylon, *catillus* (Anton), fig. 45, *beckianus* (Dunker), fig. 55, *chilensis* (Anton), fig. 57, Chili, *spenceri* (Allen), fig. 60, Portugal, *antiguensis* (Guilding), fig. 92, Antigua, *arakanensis* (Gould), fig. 100, Trinidad [? !], *isabel* [?] (Morelet), fig. 101, *perforatus* (Gould), fig. 105, United States; *lenticularis* (Hartm.), which is European, and = *fontanus* (Lightfoot), is wrongly identified, fig. 110, with *opercularis* (Gould), Sacramento River; *intertextus* (Shuttl.), fig. 123, Florida. [The quotations are very poor, and not always correct. *P. vermicularis*, fig. 104, is not new, but described by A. Gould, P. Bost. Soc. 1846.]

Planorbis glaber (Jeffr.) = *parvus* (Say) = *vermicularis* (Gould); Nelson, Q. J. Conch. No. 10, p. 182.

Planorbis metidjensis (Forbes) = *dufouri* (Graells) = *aclopus* (Bourg.), common to Portugal, Southern Spain, and Northern Africa; Fischer, J. de Conch. xxv. p. 248.

Planorbis infra-liratus, sp. n., Siberia, at the Yenissei, lat. 63° N., and *borealis* (Lovén), Siberia, lat. 56–69° N., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 59–61.

Planorbis micromphalus (Fuchs, as fossil), living in the Caspian Sea at depths of 217–756 feet; Grimm, Kasp. more fauna, ii. p. 84, radula pl. vii. fig. 8.

Planorbis nitidellus, sp. n., Martens, SB. nat. Fr. 1877, p. 112, Yokohama. *Ancylus*. Monograph by Sowerby in Reeve's Conch. Icon. pts. 336 & 337, 3 pls., 30 species and figures.

SIPHONARIIDÆ.

Siphonaria macgillivrayi, sp. n., Vélain, Arch. Z. expér. vi. p. 127, pl. iv. figs. 27–29, St. Paul and Amsterdam Islands.

Siphonaria redimiculum (Reeve), from Kerguelen Island; E. Smith, Transit Venus Exp., Moll. p. 16 [antea, p. 7].

PULMONATA OPERCULATA.

L. PFEIFFER has given some additions to his monograph of the *Pneumonopoma*, copying the descriptions of the new species published by different authors in the years 1876 & 1877; *Mal. Bl.* xxiv. pp. 144-157.

CYCLOPHORIDÆ.

Cyclophorus fuscicolor, pl. viii. A, fig. 1, and *C. (Myxostoma) nivicola*, pl. vii. figs. 1, 1 A, spp. nn., H. H. Godwin-Austen, *J. A. S. B.* xlv. pt. 2, p. 173, Daffa Hills, Assam.

Micraulax, subg. n. of planorbular *Cyclophorus*, uniting the *Myxostoma* type with turbinate *Lagochilus*; type, *M. scabra*, sp. n., pl. xiv. fig. 4, Travancore. W. Theobald, *J. A. S. B.* xlv. pt. 2, p. 185.

Pterocyclus magnus, sp. n., H. H. Godwin-Austen, *l. c.* p. 174, pl. vii. figs. 3, 3 A, 3 B, Daffa Hills, Assam.

Spiraculum nevilli, sp. n., *id. l. c.* p. 174, pl. vii. figs. 2, 2 A, Daffa Hills, Assam; *S. bhamoense* and *bitubiferum*, Theobald, *ibid.* pp. 186 & 187, Bharno.

Acroptychia, new name for *Euptychia*, preoccupied in the *Lepidoptera*; Crosse & Fischer, *J. de Conch.* xxv. p. 70.

Cyclotopsis nevilli and *flicum*, spp. nn., Morelet, *J. de Conch.* xxv. pp. 341 & 342, pl. xiii. figs. 2 & 8, Anjoana, Comoro Islands.

Cyathopoma jawaiensis, fig. 6, Naga Hills, and *nevilli*, fig. 5, Khasi and Naga Hills, p. 182, *C. garoense*, p. 183, South Garo Hills, spp. nn., H. H. Godwin-Austen, *l. c.* pl. viii. A.

Alycaeus (Gray). Monograph by Sowerby in Reeve's *Conch. Icon.* pts. 338 & 339, 6 pls. 54 species and figures, apparently new are *microstoma*, sp. n., fig. 28, Shan provinces, *nicobaricus* (Mörch), fig. 29, Nicobar Islands [= *reinhardi*, Mörch, *Vid. Medd.* 1872, p. 22]. [*A. fugorii* (Martens), sp. 53, misspelt for *jagori*.]

Alycaeus nipponensis, sp. n., Reinhardt, *JB. mal. Ges.* iv. p. 320, pl. xi. fig. 1; and *SB. nat. Fr.* 1877, p. 68, Yeddo.

Alycaeus notatus, figs. 9, 9 A, 9 B, and *daffaensis*, figs. 12, 12 A, 12 B, var. *subdigitatus* of the latter, and *A. mutatus*, figs. 11, 11 A, p. 177, spp. nn., *A. theobaldi*, Bs., var., p. 175, fig. 10; H. H. Godwin-Austen, *l. c.* pl. vii., Daffa Hills, Assam.

PUPINIDÆ.

Megalomastoma cylindraceum (Chemn.), varieties of size and colour, including *M. hialmarsoni* (Pfr.), Martens, *JB. mal. Ges.* iv. pp. 341 & 342, pl. xii. fig. 7.

Megalomastoma litteratum, sp. n., Morelet, *J. de Conch.* xxv. p. 218, Madagascar.

Megalomastoma tanycheilus [-*chilus*], sp. n., H. H. Godwin-Austen, *J. A. S. B.* xlv. pt. 2, p. 180, pl. vii. fig. 5, Daffa Hills, Assam.

Streptaulus blanfordi, Bs., from Daffa Hills, Assam; *id. l. c.* pl. viii. A, figs. 2-4.

DIPLOMMATINIDÆ.

Diplommatina labiosa and *pusilla*, spp. nn., Martens, SB. nat. Fr. 1877, pp. 98 & 99, Hakone Mountains and environs of Yeddo, Japan.

Diplommatina homeii [sic], p. 178, fig. 6, and *levigatus* [le-], p. 179, fig. 7, spp. nn., *D. austeni*, W. Blf., var., p. 178, figs. 8, 8 A; H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, pl. vii., Dafla Hills, Assam.

CYCLOSTOMATIDÆ.

Cyclostoma lienardi, sp. n., p. 214, pl. iv. fig. 2, Mauritius; *C. unicolor* (Pfr.), different varieties, *cinctum* (Sow.), and *corticulatum* (Sow.), from the same island, pp. 213, 215; *C. crosseanum* and *chromium*, spp. nn., p. 218, Madagascar. Morelet, J. de Conch. xxv. pp. 214, 215, & 218.

Cyclostoma novæ-hiberniæ (Q. & G.). Shell, operculum, and radula; Martens, MB. Ak. Berl. 1877, p. 262, pl. ii. figs. 1-4, New Ireland and New Hanover.

Choanopoma chiapasense, sp. n., Crosse & Fischer, J. de Conch. xxv. p. 362, Chiapas, S. Mexico.

Cistula aguadillensis (Pfr.), from Porto Rico; Martens, JB. mal. Ges. iv. p. 343, pl. xii. fig. 5.

Pomatias insubricum, sp. n., Pini, Atti Soc. Ital. xix. [1876, Nov.] p. 496, Valle Seriana and Valle di Scalve, Lombardy; = *canestrinii* (Adami, 1876), Adami, Bull. Soc. mal. Ital. iii. p. 16.

Pomatias grandis, sp. n., H. H. Godwin-Austen, J. A. S. B. xlv. pt. 2, pl. vii. fig. 13, Dafla Hills, Assam.

TRUNCATELLIDÆ.

Acme gracilis, sp. n., Clessin, Nachr. mal. Ges. 1877, pp. 42 & 43, Austrian Coast.

ASSIMINEIDÆ.

A. Paladilhe enumerates and discusses the known European species, *grayana* (Leach), *littorina* (Chiaje), *elise* (Paladilhe, 1875), Rochelle, Bayonne, Coimbra, *cardonæ* (Paladilhe, 1875), Minorca, *elegans*, sp. n., Minorca, *blanco*, sp. n., Cefalonia, and *siciliensis*, sp. n., Sicily. Ann. Sci. Nat. (6) v. No. 2, pl. xxvi. all figured on pl. x.

Assimineæ japonica, sp. n., Martens, SB. nat. Fr. 1877, p. 116, Yokohama, in brackish water.

Assimineæ parvula, sp. n., Morelet, J. de Conch. xxv. p. 343, pl. xii. fig. 6, Anjoana, Comoro Islands.

HELICINIDÆ.

Helicina japonica (A. Ad.). Notes by Martens, SB. nat. Fr. 1877, p. 89.

Helicina striata (Lam.), young specimens, = *subfusca* (Menke), and *H. phasianella* (Sow.), varieties of colour, Porto Rico; Martens, JB. mal. Ges. iv. p. 343.

SOLENOCONCHÆ.

Dentalium candidum, west coast of Ireland and Bay of Biscay, 416-2433 fathoms, *capillosum*, Bay of Biscay, Portugal, Azores, and Gulf of Mexico, 690-1450 fathoms, *ensiculus*, W. of Ireland and Portugal, 740-1785 fathoms, and *subterfissum*, W. of Ireland, 1000-1476 fathoms, spp. nn., Jeffreys, Ann. N. H. (4) xix. pp. 153-155.

Dentalium japonicum and *weinkauffi*, spp. nn., Dunker, Mal. Bl. xxiv. p. 68, Japan.

Siphonodentalium vitreum (Sars) = *labiatum* (Sow.), *S. affine* and *lofotense* (Sars), new localities; Jeffreys, Ann. N. H. (4) xix. p. 155 & 156.

Cadulus tumidosus, Channel slope and Bay of Biscay, 292-1450 fathoms, *cylindratus*, W. of Ireland, 1215-1476 fathoms, *gracilis*, North Atlantic, spp. nn., and *C. olivi* (Scacchi as *Dentalium*, 1835, fossil) found in the recent state, W. of Ireland and in the Channel slope, 539-1450 fathoms; *id. l. c.* pp. 156-158.

[*Cadulus*] *Cadus divæ*, sp. n., Vélain, Arch. Z. expér. vi. p. 128, pl. v. figs. 1 & 2, St. Paul Island.

LAMELLIBRANCHIA.

Anatomical descriptions of the structure of the gills, the organ of Bojanus, &c. (See above in the general subject, Anatomy and Physiology.)

PHOLADIDÆ.

Bactronophorus, new name for *Calobates* (Gould, 1862, *nec* Kaup, *Aves*, 1829); Tapparone-Canefri; Ann. Mus. Genov. ix. p. 290.

MYIDÆ.

Mya truncata (L.) var. *uddevalensis* (Forb.). Discovery Bay, 81° N. lat. E. Smith, Ann. N. H. (4) xx. p. 145.

SAXICAVIDÆ.

Saxicava arctica (L.), Discovery Bay, 81° N. lat., a solid purplish-brown coloured variety at Franklin-Pierce Bay, 79° N. lat.; E. Smith, Ann. N. H. (4) xx. p. 145.

Saxicava bisulcata, sp. n., *id.*, Transit Venus Exp., *Moll.* p. 18, pl. ix. fig. 21, Kerguelen Island [*anted.* p. 6].

ANATINIDÆ.

Lyonsia arenosa (Möller) = *gibbosa* (Hancock, 1846), Discovery Bay, 81° N. lat.; *id.* Ann. N. H. (4) xx. p. 140.

Pandora (*Kennerlia*) *grandis*, sp. n., Dall, P. Cal. Ac. 1877, separate copy, p. 5, Unalaska to Puget Sound.

SOLENIIDÆ.

Cutellus (Ensiculus) philippianus, sp. n., Dunker, Mal. Bl. xxiv. p. 68, Japan.

TELLINIDÆ.

Tellina lucida (Desh.), Algeria. Note on it by T. de Monterosato, J. de Conch. xxv. p. 28.

Tellina opalina (Chemn.) = *planissima* (Anton), and *T. dolabella* (Sow.), from Quelimane, Mozambique; E. Smith, P. Z. S. 1877, p. 720.

Tellina (Macoma) tenera (Leach), Discovery Bay, 81° N. lat.; *id.* Ann. N. H. (4) xx. p. 140.

Donax æmulus, sp. n., *id.*, P. Z. S. 1877, p. 721, pl. lxxv. figs. 23-25, Quelimane, Mozambique.

Donax semigranosus, sp. n., Dunker, Mal. Bl. xxiv. p. 68, Japan.

PAPHIIDÆ.

Donacilla picta, sp. n., Dunker, Mal. Bl. xxiv. p. 68, Japan.

Ervilia australis, sp. n., Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 21, Port Jackson.

MACTRIDÆ.

Trigonella crossii, sp. n., Dunker, Mal. Bl. xxiv. p. 74, Japan.

Cryptodon, Conrad, 1837 = *Tresus*, Gray (as *Cryptodon*, Turton, 1822), = *Thyasira*, Leach, 1818 [not published]; Conrad, P. Ac. Philad. 1877, p. 24.

VENERIDÆ.

Dosinia orbiculata, sp. n., Dunker, Mal. Bl. xxiv. p. 69, Japan.

Cytherea lentiginosa (Chemn.). On its varieties in the Red Sea; Pagenstecher, in Kossmann's Zool. Ergebnisse, i. pt. 2, p. 40, figs. 21-26.

Cytherea sophiæ, sp. n., Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 23, Botany Bay.

Venus (Caryatis) antarctica, sp. n., Vélain, Arch. Z. expér. vi. p. 138, pl. v. figs. 21 & 22, St. Paul Island, Southern Indian Sea.

Venus ioenia, new name for *discina* (Phil. Moll. Sic. i., *nec* Lam.) = *cygnus* (Weinkauff, Aradas & Ben., *nec* Lam.), distinct from *casina* (L.), and *V. rusterucii* (Payr.), being the young state of the latter; Benoit & Grillo, Bull. Soc. mal. Ital. iii. pp. 61-64.

Tapes græffii, sp. n., Dünker, Mal. Bl. xxiv. p. 73, Japan.

CYRENIDÆ.

Cyrena. Monograph in Reeve's Conch. Icon. continued and finished, pts. 332 & 333, from pl. xi. No. and fig. 43 to pl. xix. No. and fig. 114, apparently new. *C. concinna* (Sow.), fig. 66, *cyreniformis* (Prime), fig. 69,

arata (Blanf.), fig. 93, Tenasserim, *fragilis* (Desh.), fig. 98 [is *mexicana* (Sow.)], *donaciformis* (Sow.), fig. 108, Florida [= *floridana*, Conrad, 1846]. Moreover, many species are here figured for the first time.

Cyrena. S. Clessin gives a monograph of this genus in the new edition of Chemnitz, pts. 258 & 263, pp. 101-128, Nos. 1-38, pls. xiii.-xxiii. Species new or not before figured are: *C. rugulosa* (Mouss., MS.), p. 106, pl. xv. figs. 1 & 2, Cape York, N. Australia, *oviformis* (Desh.), p. 107, pl. xv. fig. 3, Port Essington, *alabamensis*, sp. n., p. 144, pl. xix. figs. 3 & 4, Alabama.

Corbicula. S. Clessin begins a monograph of this genus in the new edition of Chemnitz, pts. 263 & 267, pp. 129-160, Nos. 1-49. New: *C. viridis*, p. 131, pl. xxiv. figs. 1 & 2, *maltzaniana*, p. 132, pl. xxiv. figs. 3 & 4, & *crassa*, p. 133, pl. xxiv. figs. 5 & 6, locality of all these unknown; *heuglini*, p. 139, pl. xxv. figs. 1 & 2, Lake Tzana in Egypt [Abyssinia!]; *rivina*, p. 140, pl. xxv. figs. 3 & 4, Murray River, Australia; *senegalensis*, p. 141, pl. xxv. figs. 9 & 10, Senegal; *meridionalis*, p. 138, pl. xxv. figs. 13-17, Senegal; *rostrata*, p. 142, pl. xxv. figs. 5 & 6, locality unknown; *viridula*, p. 143, pl. xxv. figs. 19 & 20, locality unknown; *indica*, p. 143, pl. xxv. figs. 21-23, East Indies?; *natalensis*, (Krauss, MS.), p. 125, pl. xxvii. figs. 19-21, Natal; *albida* (Krauss, MS.), p. 156, pl. xxvii. figs. 25 & 26, River Lepenula, Southern Africa; *alba*, p. 157, pl. xxvii. figs. 27 & 28, White Nile in Sennar.

Corbicula straminea and *biformis*, Reinhardt, SB. nat. Fr. 1877, p. 70, & *C. transversa*, Martens, tom. cit. p. 120, spp. nn., Japan.

Corbicula yunnanensis and *andersoniana*, spp. nn., Nevill, J. A. S. B. xvi. pt. 2, pp. 40 & 41, Yunnan.

Velorita cyprinoides (Gray) and *cochinensis* (Hanl.), Sowerby, in Reeve's Conch. Icon. pts. 234 & 235, 1 pl.

Sphærium. Clessin gives a monograph of this genus in the new edition of Chemnitz, pts. 257 & 258, pp. 75-99, Nos. 1-28, pls. ix-xii. The new or not before figured species are: *S. oblongum*, new name for *Cyclas rivalis* (Dupuy & Brard, nec Drap.) = *S. corneum*, var. 3 (Bourg.), p. 83, pl. ix. figs. 25-27, France, *westerlundii*, new name for *corneum*, var. *nucleum* (Westerlund), p. 84, pl. x. figs. 6-8, Dalarne, Sweden, *firmum* (Clessin), p. 84, pl. x. figs. 9-11, Denmark and Northern Germany, *mamillanum* (Westerlund), p. 85, pl. x. figs. 12-14, Sweden, *dupplicatum* [dupl.] (Clessin), p. 86, pl. xi. figs. 4-6, Lakes of Bavaria, *draparnaldi*, new name for *Cyclas lacustris* (Drap.) = *ovalis* (Fér.) [1807] = *consobrina* (Fér.), p. 87, pl. xi. figs. 7-9, nearly all Europe, *sandbergeri*, sp. n., p. 89, pl. xii. figs. 13-15, Würzburg, Germany, *obense*, sp. n., p. 90, pl. xi. figs. 12-14, Obi River, Siberia, *pisidioides* (Gray), p. 94, pl. x. figs. 3-5, England, *fragile*, sp. n., p. 95, pl. xi. figs. 18-20, Vegesack, near Bremen, *dickini*, sp. n., p. 96, pl. xii. figs. 18-20, Main River, near Frankfurt, *nitidum*, sp. n., p. 98, pl. xii. figs. 9-11, Siberia.

Sphærium nitidum (Clessin, MS.) and *levinodis*, spp. nn., Siberia, at the Yenissei, lat. 69° and 62° N., Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 66 & 67, pl. i. figs. 19 & 20.

Cyclas lusitanica, sp. n., Morelet, J. de Conch. xxv. p. 258, Portugal.

Calyculina lacustris (Müll.) var. *septentrionalis* (Clessin), Siberia, lat. 60° N.,⁴ Westerlund, *l. c.* p. 68, pl. i. fig. 18.

Pisidium. S. Clessin finishes the monograph of this genus in his new edition of Chemnitz, pt. 257, pp. 57-74, Nos. 41-57, pls. vii. & viii. New or not before figured are: *P. mighelsianum*, sp. n., = *minus* (Mighels in coll.), p. 57, pl. vi. figs. 19-21, Cambridge, U. S. A., *herminii*, sp. n. (Wewitsch, MS.), p. 61, pl. vii. figs. 12-14, Sierra d'Estrella, Prov. Beira, Spain [Portugal], *d'orbignyi* [*dorbignii*], new name for *pulchellum* (Orb., nec Jenyns), p. 62, pl. vii. figs. 3 & 4, Maldonado, *sibiricum* (Clessin, 1876), p. 66, pl. vii. figs. 15-17, Yenissei River, 60-69° N. lat., *nordenskiöldi* (Clessin, 1876), p. 67, pl. vii. figs. 18-20, N.W. Siberia, *foreli* (Clessin, 1876), p. 68, pl. viii. figs. 1-3, Lakes of Constance and Geneva, in depths exceeding 20 mètres, *occupatum* (Clessin, 1876), p. 69, pl. viii. figs. 10-12, Lake of Neufchatel, 65 mètres, *urinator* (Clessin, 1876), p. 70, pl. viii. figs. 16-18, Lake of Zurich, 28-50 mètres, *profundum* (Clessin, 1876), p. 70, pl. viii. figs. 13-15, Lake of Geneva, 60 mètres, *demissum* (Clessin, 1876), p. 71, pl. viii. figs. 19-21, Lake of Constance, in depths exceeding 20 mètres, *ovatum*, sp. n., p. 72, pl. viii. figs. 22-24, Schwarzwald and Bairischer Wald, Southern Germany.

Pisidium submersum, *prolongatum*, and *conventus*, spp. nn., the second from the Lake of Wallenstädt in Switzerland, in a depth of 136 mètres, the two others from the Lake of Starnberg in Bavaria, at a depth of 50 mètres; Clessin, Mal. Bl. xxiv. pp. 179-181, pl. iii. figs. 5-7.

Pisidium nordenskiöldi, *sibiricum*, *boreale*, and *mucronatum*, spp. nn. (Clessin, MS.), Westerlund, Sv. Ak. Handl. (2) xiv. 2, No. 12, pp. 68-71, Siberia, at the Yenissei, lat. 62°, 68°, & 69° N., pl. i. figs. 20-23.

Pisidium bombayanum, Western Ghats, and *nevillianum*, Roorkee, p. 188, *atkinsonianum*, p. 189, Sikkim, spp. nn., W. Theobald, J. A. S. B. xlv. pt. 2.

CARDIIDÆ.

Cardium islandicum (Chemn.), Dobbin Bay, 79° N. lat., and synonymy, E. Smith, Ann. N. H. (4) xx. p. 141.

Cardium burchardti, sp. n., Dunker, Mal. Bl. xxiv. p. 67, Japan.

Cardium pyramidatum, *berri*, *longipes*, and *barbotdemarnii*, spp. nn., Grimm, Kasp. more faun. ii. pp. 46, 51, 54, & 56, pl. viii. figs. 1, 2, 4, & 6, Caspian Sea. *C. crassum* (Eichw.), *catillus* (Eichw.), and *pseudocatillus* (Albich), also recent in the Caspian Sea; *id. l. c.* pp. 50, 58, & 62, pl. viii. figs. 3 & 7-10.

Adacna edentula (Pall.) and *plicata* (Eichw.); Grimm, *l. c.* pp. 64 & 66, pl. viii. figs. 11-13 & 14, Caspian Sea.

LUCINIDÆ.

Lucina (*Codakia*) *quadrata*, sp. n., Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 24, Botany Bay.

Azinus gouldi (Phil.)?, Discovery Bay, 81° N. lat., E. Smith, Ann. N. H. (4) xx. p. 141.

KELLIIDÆ.

Kellia solida, sp. n., Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 25, Port Jackson.

Kellia consanguinea, sp. n., E. Smith, Transit Venus Exp. Moll., p. 18, pl. ix. fig. 20, Kerguelen Island, distinct from the European *rubra* (Mont.) [antea, p. 6].

Lascæ rubra (Mont.), from St. Paul and Amsterdam Islands, Vélain, Arch. Z. expér. vi. p. 136 [perhaps the same as the preceding].

Erycina veneris, sp. n., id. l. c. p. 133, pl. v. figs. 12-14, St. Paul Island, in depths of 35-80 mètres.

Lepton parasiticum (Dall), B. Smith, Transit Venus Exp. Moll. p. 19, pl. ix. fig. 22, Kerguelen Island, parasitic on *Hemaster* [antea, p. 6].

Montacuta ? væringi, sp. n., Friele, N. Mag. Naturv. xxiii. [1876] p. 1, JB. mal. Ges. iv. p. 257, Sognefjord, Norway, 630 fathoms.

Turquetia, g. n.; hinge with a narrow cavity for an internal ligament, left valve with a distinct cardinal tooth, right valve with a rudimentary one. Pallial line entire. *T. fragilis*, sp. n., St. Paul Island. Vélain, Arch. Z. expér. vi. pp. 134 & 135, pl. v. figs. 15-17.

Mysella, g. n.: shell small, thin, equivalvular, inequilateral, quadrately cuneate, concentrically striated. Hinge with a small triangular internal cartilage-pit, close to which is a single small diverging subcircular flattened cardinal tooth in each valve, and with two thin short horizontal lateral processes in the other valve. Siphonal inflection none. *M. anomala*, sp. n., long. 5, alt. 4, lat. 2 lin., Port Jackson, Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 22. The author places it near *Ervilia*, in the *Tellinidæ*, l. c. p. 191.

ASTARTIDÆ.

Astarte semisulcata (Leach) and *fabula* (Reeve), Dumb-bell Harbour, 82° N. lat., *striata* (Leach) and ? *warehami* (Hanc.), Franklin-Pearce Bay, 79° N. lat., and on their synonymy; E. Smith, Ann. N. H. (4) xx. pp. 142-144.

Astarte acuticostata, sp. n., Jeffreys & Friele, N. Mag. Naturv. xxiii. [1876] JB. mal. Ges. iv. p. 257, Northern Norway and North Atlantic, 290-510 fathoms.

Lutetina, g. n. Very near *Lutetia* (Desh., fossil); hinge with a cavity for an internal ligament; two cardinal teeth in the left valve; two cardinal teeth, one of which is very small and V-shaped, and a posterior lateral tooth, in the right valve. *L. antarctica*, sp. n., St. Paul Island. Vélain, Arch. Z. expér. vi. pp. 136 & 137, pl. v. figs. 18-20.

Rochefortia, g. n. Shell transverse, inequivalvular, inequilateral, hinge with an internal ligament; two cardinal and two lateral teeth in the left valve, only lateral teeth in the right; pallial lines entire, umbones scarcely prominent. *R. australis*, sp. n., St. Paul Island, South Indian Sea, between the roots of *Algæ*. Id. l. c. pp. 132 & 133, pl. v. figs. 9-11.

UNIONIDÆ.

Unio requieni (Mich.) and other species in warm water of 29–30° C., at Barbotan, in France; Dupuy, J. de Conch. xxv. pp. 18 & 23.

Unio nipponensis, sp. n., Martens, SB. nat. Fr. 1877, p. 119, Mukosima, Japan.

Unio languilati, var. n. *aligerus*, *compressus*, and *caveatus*, spp. nn., Heude, Conch. fluv. de Nanking, fasc. iii. pls. xvii. & xxiv., Prov. Nanking and (the third) Honan, China.

Unio footii, sp. n., W. Theobald, J. A. S. B. xlv. pt. 2, p. 187, pl. xiv. fig. 9, Gutparba, River Kistna.

Unio marginalis (Lam.), var. n. *savadiensis*, Sawady, in the river Thengleng, *U. fragilis*, sp. n., an = *foliaceus* (Gould) ?, Yaylaymaw, and *andersoniana* [-us], sp. n., Myadoun, Nevill, J. A. S. B. xlv. pt. 2, pp. 37–40.

J. Lewis enumerates a number of nearly allied species of *Unio*, some living in the Ohio, others in the Alabama, and calls them *equivalent species*; further, he enumerates 19 species belonging to the group of *Unio parvus* (Barnes); P. Ac. Philad. 1877, pp. 24–36.

Pseudodon secundus, sp. n., Heude, Conch. fluv. de Nanking, fasc. iii. pl. xviii. No. 38, Hoai river, Prov. Nanking.

Cristaria spatiosa (Clessin), very near *herculea* (Midd.), Japanese specimens; Martens, SB. nat. Fr. 1877, p. 118.

Anodonta piscinalis (Nilss.). On a pearl within it, containing a small insect; Sordelli, Bull. mal. v. [1872] p. 12, pl. i. figs. 12 & 13.

Anodonta lauta, sp. n., Martens, SB. nat. Fr. 1877, p. 117, Yeddo.

Anodon securiformis, *arcaformis* [arcif-], *nigricans*, *fluminea*, *lucida*, *rivularis*, spp. nn., Heude, Conch. fluv. de Nanking, fasc. iii. pls. xviii.–xx., Prov. Nanking and Honan, China.

Mycetopus [?] *carinatus*, *oleivorus*, *recognitus*, *rivularis*, and *similis*, spp. nn., id. l. c. pls. xxi.–xxiii., Middle China.

DREYSENIDÆ.

Dreysena brardi (Brogn.), var. n. *caspia*, distinct from *caspia* (Eichw.) and *rostriformis* (Desh.), all three living in the Caspian Sea; Grimm, Kasp. more fauna, ii. pp. 74, 72, & 71, the first pl. viii. fig. 15.

MYTILIDÆ.

Mytilus edulis. A. Sabatier has published the first half of a full anatomy of this species, treating the intestinal, circulatory, and respiratory organs; Ann. Sci. Nat. v. Nos. 1 & 2, 132 pp., 9 pls. Some points of more general bearing are already mentioned above.

T. Tullberg has examined the byssal glands in *Mytilus edulis* (L.), and comes to results somewhat different from those of A. Müller in 1836. There are many glands, partly of whitish, partly of greenish colour within the foot, and chiefly in the walls of the byssal excavation; these secrete the substance of the byssus, which is moulded in the shelves

(Fächer) of that cavity and in the furrows at its opening. N. Act. Upsal. (3) ix. 8 pp., 1 pl.

Mytilus magellanicus (Chemn.) and *edulis* (L.) [?], Kerguelen Island, E. Smith, Transit Venus Exp. Moll. pp. 22 & 23 [*anted*, p. 6].

Modiola martorelli, new name for *M. incurvata* of Jeffreys, Weinkauff and Monterosato, distinct from the fossil *incurvata* (Phil.); Hidalgo, Mol. mar. de Esp., pt. 13, and J. de Conch. xxv. p. 396.

Modiolaria levigata (Gray), Franklin-Pierce Bay, 79° N. lat., differentiated from *discors* (L.); E. Smith, Ann. N. H. (4) xx. p. 145.

Modiolaria corallina, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 291, New Guinea.

Modiolaria exilis (H. & A. Ad.) and *minuta* (Dall, as *Kidderia*), E. Smith, Transit Venus Exp. Moll. pp. 24 & 25, pl. ix. figs. 24 & 23, Kerguelen Island [*anted*, p. 6].

Hochstetteria, g. n. Hinge as in *Avicula*, rather long and straight, transverse striate, with an oblong cavity for an internal ligament; two muscular scars. *H. aviculoides*, *modiolina*, and *crenella*, spp. nn. Vélain, Arch. Z. expér. vi. pp. 129-131, pl. v. figs. 3-8, St. Paul and Amsterdam Islands, in the littoral zone, affixed by a byssus to *Algæ* and *Bryozoa*.

AVICULIDÆ.

Notes on pearl-oyster fishing at the North-western coast of Australia, by Glinz, Ber. St. Gall. Ges. 1876, p. 165.

Avicula falcata, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 291, New Guinea.

Isognomon flabellum, sp. n., Red Sea, and on *I. anomioides* (Rv., *Perna*); Pagenstecher, in Kossmann's Zool. Ergebnisse, i. 2, p. 32, fig. xx.

Pinna stutchburii (Rv.): varieties in the Red Sea; *id. l. c.* p. 31.

ARCIDÆ.

Arca frielii, sp. n., Jeffreys & Fricke, N. Mag. Naturv. xxiii. [1876], JB. mal. Ges. iv. p. 258, Northern Norway, 1100-1500 fathoms.

Barbatia paulucciana, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 292, New Guinea.

Lissarca, subg. n. of *Arca*, near *Barbatia* (Gray). Shell concentrically, not radiately, striated, umbones nearly terminal, a few teeth on both sides of the hinge, none in the middle, edges of the valves crenate. *A. (L.) rubro-fusca*, sp. n. E. Smith, Transit Venus Exp. Moll. p. 19, pl. ix. fig. 17, Kerguelen Island [*anted*, p. 6].

Anomalocardia striatella, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 292, New Guinea.

Pectunculus vestitus and *fulguratus*, spp. nn., Dunker, Mal. Bl. xxiv. p. 72, Japan.

NUCULIDÆ.

Seguenza's paper on the tertiary species of this family, which also dis-

cusses incidentally several recent species, is mentioned above under the subject, "Palæontology of Recent Species," p. 25.

Nucula inflata (Hanc.), Discovery Bay, 81° N. lat.; E. Smith, Ann. N. H. (4) xx. p. 141.

Nucula pusilla, sp. n., Angas, P. Z. S. 1877, p. 177, pl. xxvi. fig. 26, Port Jackson.

Leda pernula (Müller) and *glucialis* (Leach), Discovery Bay, 81° N. lat., and their synonymy; E. Smith, Ann. N. H. (4) xx. pp. 141 & 142.

Leda jeffreysi, new name for *L. lata* (Jeffer., nec Hinds); Hidalgo, Mol. mar. de Esp. pt. 13, and J. de Conch. xxv. p. 396.

Leda ensicula[-us], sp. n., Angas, P. Z. S. 1877, p. 177, pl. xxvi. fig. 27, Port Jackson, 45 fathoms.

Yoldia. A tentacular organ on the right side, near the base of the siphon, described by W. Brooks, P. Am. Ass. xxiii. 1875, pp. 80-82, woodcut.

Yoldia subaquilateralis (Smith, 1875); E. Smith, Transit Venus Exp., Moll. p. 21, pl. ix. fig. 18, Kerguelen Island [*antèa*, p. 6].

Solenella gigantea (Smith, 1875); *id. l. c.*, fig. 19, Kerguelen Island.

PECTINIDÆ.

Pecten lividus (Lam.). On its varieties in the Red Sea; Pagenstecher, *l. c.* p. 29.

Pecten puncticulatus, *trifidus*, and *vesiculosus*, spp. nn., Dunker, Mal. Bl. xxiv. pp. 71 & 72, Japan.

Pecten (Pseudamusium) grœnlandicus (Sow.), Discovery Bay, 81° N. lat.; E. Smith, Ann. N. H. (4) xx. p. 146.

Lima japonica, sp. n., Dunker, Mal. Bl. xxiv. p. 70, Japan.

[*Lima*] *Radula (Limatula) pygmæa* (Phil.), E. Smith, Transit Venus Exp., Moll. p. 25, pl. ix. fig. 16, Kerguelen Island [*antèa*, p. 6].

Spondylus aculeatus (Chemn.). Note on its varieties in the Red Sea; Pagenstecher, in Kossmann's Zool. Ergebnisse, i. 2, p. 26.

Spondylus pictorum (Chemnitz), from Peruvian graves; Troschel, SB. Ver. Rheinf. 1877, p. 158.

Plicatula ramosa (Lam.). Note on its varieties in the Red Sea; Pagenstecher, *l. c.* p. 24.

Plicatula cuneata and *rugosa*, spp. nn., Dunker, Mal. Bl. xxiv. p. 73, Japan.

OSTREIDÆ.

Prof. Möbius has published a little book on the oyster and its breeding, chiefly with regard to the oyster beds on the western shore of Schleswig. He points out the obstacles which the coldness of the winter and the soft mobile consistence of the sea-bottom offer to any extension of oyster-breeding, and states that a single adult oyster produces annually about 440,000 young animals, but that scarcely one of these reaches maturity; the number of young oysters in a bank is always less than that of adults, about 0.42-0.48, as has been found from repeated dredgings during many years. Therefore, if the take is not very moderate and cautious, the oysters will certainly decrease. In England and France,

the physical conditions are more favourable to the oyster, but there also moderation is needed in order that the number may not be diminished. *Auster* u. *Austernwirthschaft*, chiefly third and ninth chapters, pp. 13 & 56.

Notes on oyster-breeding on the shores of Germany by Möbius, *Circulare des deutschen Fischerei-Vereins*, 1877, pp. 54-62; in France, pp. 179-182. A translation of pp. 19 & 20 in the Californian newspaper "Democrat."

The violet colour of some oysters at Arcachon had been examined by Descourt, *C. R.* lxxxv. pp. 969-971.

B. L. Bally proposes the use of hard substances, which eventually become soft, for fixing young oysters. *Assoc. Franç.* iv. Nantes, pp. 812-814.

Ostrea plicatula (Gm.) = *crenulifera* (Sow.) = *cucullina* (Desh.) = *denticulata* (Born) = *barclayana* (Sow.) = *deformis* and *cornucopiae* (Lam.) = *cucullata* (Born) = *forskali* (Gmelin), and five chief varieties of it (A) *pinnicola*, (B) *tridacnicola*, (C) *crenulifera*, (D) *spongicola*, and (E) *forskali*, all in the Red Sea; Pagenstecher, in Kossmann's *Zoologische Ergebnisse*, i. pt. ii. pl. xvi. figs. 1-16.

MOLLUSCOIDA.

BY

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LIST OF MORE IMPORTANT PUBLICATIONS.

- BARROIS, J. Recherches sur l'embryologie des Bryozoaires. Paris & Lille: 1877, 4to, 305 pp. with 16 plates.
- DALL, W. H. Index to the names which have been applied to the subdivisions of the class *Brachiopoda*, excluding the Rudistes, previous to the year 1877. Washington: 1877, 8vo, 88 pp. (Bull. U. S. Mus. No. 8).
- . Scientific Results of the Exploration of Alaska. III. Report on the *Brachiopoda* of Alaska. Also in P. Ac. Philad. 1877, pp. 155-169.
- FOL, H. Sur la formation des œufs chez les Ascidies. J. de Microgr. i. pp. 281-284, pl. i.
- FRIELE, H. The development of the skeleton in the genus *Waldheimia*. Arch. Math. Naturvid. ii. pt. iv. pp. 380-386.
- HATSCHKE, B. Embryonalentwicklung und Knospung der *Pedicellina echinata*. Z. wiss. Zool. xxix. pp. 502-549, pls. xxviii.-xxx.
- HÉROUARD, J. Sur les courants de nutrition des Brachiopodes. J. de Conch. xxv. pp. 229-241.
- HINCKS, T. On *Polyzoa* from Iceland and Labrador. Ann. N. H. (4) xix. pp. 97-112, pls. x. & xi.
- . Note on the radical fibres of the *Polyzoa*. Op. cit. xx. pp. 218-220.
- . On British *Polyzoa*. Tom. cit. pp. 212-218 & 520-532.
- JOLIET, L. Contributions à l'histoire naturelle des Bryozoaires des côtes de France. Arch. Z. expér. vi. pp. 193-304, pls. vi.-xiii.
- KOREN, F., & DANIELSEN, C. Fauna littoralis Norvegiæ. Part iii. 1877, fol.
- LANGERHANS, P. Zur Anatomie der Appendicularien. MB. Ak. Berl. 1877, pp. 561-566.

- MOSELEY, H. N. On two new forms of deep-sea Ascidiæ, obtained during the voyage of H.M.S. "Challenger." Tr. L. S. (2) i. pp. 287-294, pl. xlv.
- SALENSKY, W. Études sur les Bryozoaires entoproctes. Ann. Sci. Nat. v. Nos. 3-5, 59 pp., 4 pls.
- . Ueber die Knospung der Salpen. Morph. JB. iii. pp. 549-602, pls. xxviii.-xxx.
- VOGT, C. Sur le *Loxosoma phascolosomatum*. Arch. Z. exper. vi. pp. 305-357, with 4 pls.; also Q. J. Micr. Sci. 1877, pp. 354-376, pl. xxii.

BRACHIOPODA.

J. HÉROUARD examines the currents of water produced by the ciliated arms within the pallial cavity of the Brachiopods, imitating them by an apparatus of perforated leaden tubes and flexible bristles; he comes to the conclusion that in *Argiope* this circulatory apparatus is the least perfect, and that *Morrisia*, *Terebratula*, and *Crania* form an ascending line from *Argiope* to *Lingula*, in which it is the most perfect; *Thecidium* and *Rhynchonella* cannot be comprised in the same ascending line, but their degree of perfection is between *Terebratula* and *Crania*. In *Lingula*, *Crania*, *Rhynchonella*, and *Thecidium* the currents form a distinct whorl near the mouth, which is wanting in *Argiope*, *Morrisia*, and *Terebratula*. J. de Conch. xxv. pp. 229-241.

The two channels opening with a funnel-shaped orifice into the visceral cavity, and with another outside, regarded by former anatomists as hearts, by others as oviducts, are probably homologous to the organ of Bojanus in the Lamellibranchs, and therefore excretory organs, as had been already supposed by Huxley; GRIESBACH, Arch. f. Nat. xliii. p. 101.

General observations on the organization and systematic place of the *Brachiopoda*, by T. DAVIDSON, in Ann. Mal. Belg. x. [1875].

W. H. DALL (Bull. U. S. Mus. No. 8, *supra*) gives an alphabetical index of names applied to the class, orders, tribes, families, genera, subgenera, and sections of the *Brachiopoda*, previous to 1877 (excluding those before the 10th edn. of the Syst. Nat.), with indications of the date, and bibliographical and critical observations. He also adds a systematic list of the genera, and lists of genera of uncertain position, of others not restricted to *Brachiopoda*, or wrongly referred to the group, and of the Linnean species and their modern equivalents, with tables showing the known distribution of the chief divisions in geological time. All those living in Cretaceous times have endured until now; all now living had Palæozoic representatives, but half the Palæozoic families do not appear to have survived the Mesozoic changes.

List of Brachiopods from the coasts of Spain and Portugal; G. Hidalgo, Mol. mar. Esp. [antea, p. 3], part 13.

List of Brachiopods dredged off Marseilles at depths of from 60 to 350 mètres, by A. F. MARION, Rev. Montp. iv. [1876, March], and J. de Conch. xxv. p. 299.

The *Brachiopoda* of the North-west coast of America, from California to Alaska, 8 species of *Terebratulidæ*, 1 *Rhynchonella*, and 1 *Lingula* (*Glotidia*) are enumerated, and their bathymetrical distribution indicated; Dall, Sci. Results Expl. Alaska, iii., and P. Ac. Philad. 1877, pp. 155-169.

Terebratula cernica (Crosse) is the only Brachiopod hitherto known from Mauritius and adjacent islands; Liénard, Faune malac. de l'île Mauritius, p. 72.

Waldheimia. The development of the skeleton is the subject of a paper by H. Friele, Arch. Math. Naturvid. ii. pp. 380-386 [not seen by the Recorder].

Waldheimia dilatata (Lam.) from Kerguelen Island; E. Smith, Transit Venus Exp., Moll. p. 26 [*antea*, p. 6].

Terebratella sanguinea (Ohemn.), found at the island Sorong, N.W. of New Guinea; Ann. Mus. Genov. ix. p. 293.

Magasella. DALL, Sci. Res. Exp. Alaska, iii., points out that each known species of *Magasella* resembles very much in all external characters another *Terebratulid* living in the same region, and can only be distinguished by the internal skeleton, but he cannot decide as to their real relations.

Magasella radiata, sp. n., *id. l. c.*, p. 159, Shumagin Islands.

Megerlia jeffreysi, Dall (*Ismenia*), 1871, Semidi Islands, Alaska, from 155-345 fathoms, is perhaps a deformity of *Waldheimia cranium*, occasioned by want of calcareous matter; *id.*, P. Ac. Philad. 1877, pp. 158 & 169.

Kraussina lamarckiana (Davids), lives at St. Paul's Island, in the littoral zone, Vélain, C. R., July, 1876; Arch. Z. expér. vi. pp. 139-142, pl. v. figs. 23-26; J. de Conch. xxv. p. 296. *Kraussia atkinsoni*, sp. n., Tenison-Woods, P. R. Soc. Tasm. 1877, p. 34, Tasmania.

Argiope cistellula (Jeffr.), at Weymouth; Damon, Q. J. Conch. No. 11, p. 217.

TUNICATA.

R. GARNER endeavours to point out morphological homologies between the *Tunicata* and the *Mollusca*, comparing the endostyle of the former with the crystalline stick of some Bivalves, and even with the chorda dorsalis of the *Vertebrata*, the tail of the larvæ of the Ascidiæ with that of *Carinaria*, &c. Ann. N. H. (4) xix. pp. 357-380.

W. SALENSKY has described the process of budding in *Salpa africana* (Forsk.) and some other species, and comes to the following conclusions and comparisons. Contrary to Kowalewsky, the individual organs of the bud have, according to him, no special connection with the like in the mother, though they take their origin in the prolongation of the same original layer, endoderm or ectoderm, which has given origin to the same organs of the mother. He refutes also the statement of some former authors that the new individual is formed by two buds. As to development, *Salpa* is nearer *Pyrosoma* than the Ascidiæ. The branchial sac of the latter belongs originally to the intestine, as in *Appendicularia*; the clefts in it are a peculiarity of the Ascidiæ, which have no morphological relations either to the openings of the branchial sac in *Appendicularia*

(which correspond to the cloacal opening), or to the branchial of *Salpa*, as proved by the different situation of the endostyle. The development of the *Salpæ* is to be regarded as an abbreviation of that of the Ascidians. Morph. JB. iii. pp. 549-602, pls. xxviii.-xxx., and Z. wiss. Zool. xxviii. pp. 396-398. A fuller abstract by H. v. Ihering, in JB. Anat. Physiol. vi. pp. 93-97.

P. LANGERHANS describes the muscular and nervous systems in the tail of *Oecopleura* and *Fritillaria*; the caudal nerve situated above the chorda has 12-16 ganglions disposed in pairs; the muscular nerves come in pairs at nearly equal distances from the trunk of the caudal nerve, and are to be regarded as spinal nerves; the tail consists of six segments, each of which is formed by a single muscular plate. MB. Ak. Berl. 1877, pp. 561-566.

Prof. HARTMANN gives some notes on the anatomy of *Ascidia mentula* (L.); SB. nat. Fr. 1877, pp. 208-211.

N. NASSONOFF's paper on the anatomy of *Circinalium* and *Molgula*, at the meeting of the Russian naturalists at Warsaw, Sept., 1876, has not been seen by the Recorder.

The formation of the egg in *Phallusia intestinalis* (L.) has been examined by H. FOL; he comes to the somewhat strange result that the cells of the follicular epithelium have their origin within the egg, and emigrate from thence to the surface; the cells of the test having no relation either to these follicular cells or to the so-called corpuscula of direction. J. de Microgr. i. pp. 281-284, pl. 1.

Octacnemus, g. n. Test gelatinous and hyaline, stellate, with eight rays; respiratory sac flattened; no gill-network; inhalant and exhalant orifice between the same rays, the former a transverse slit, the latter round and tubiform, situated more outwards; nerve-ganglion on the nucleus; endostyle distinct. *O. bythius*, sp. n., North of New Guinea, near Schouten Island, 1070 fathoms. Moseley, Tr. L. S. (2) i. pp. 289-292, pl. xlv. figs. 7-13.

Hypobythius, g. n., allied to *Boltenia*, of transparent hyaline tissue, with symmetrically arranged cartilaginous plates; exhalant orifice at the end of a short tube projecting externally. *H. calycodes*, sp. n., North Pacific Ocean, lat. 37° N., 2900 fathoms; *id. l. c.* pp. 287-289, pl. xlv. figs. 1-6.

Chelyosoma in the White Sea; Wagner, Meeting of Russian naturalists at Warsaw, Sept., 1876 (Z. wiss. Zool. xxviii. p. 385).

POLYZOA.

L. JOLIET comes, by anatomical researches and physiological experiments upon *Bowerbankia imbricata*, to the conclusion that what has been called a colonial nervous system is not at all of nervous nature, the animals showing no motion or its irritation; it is formed chiefly by spindle-shaped cells, and is a prolongation of the single cystids; he proposes for it the term "endosarc." Transversely striated muscles and a nervous ganglion are most evident in *Eucratea chelata*. He supports the view that cystid and polypid represent different individuals; the "brown

bodies" [see Zool. Rec. viii. p. 179] are, according to him, dead and decaying polypids, which sometimes come into the interior of living polypids, and are then removed by the vent, either as a whole or in pieces. The eggs are formed at the tip of the funiculus, the spermatozooids at its base; the funiculus as well as the retractor muscles are to be regarded as parts of the polypid; the eggs pass from thence into peculiar oviells, and are fecundated either before or after their entrance; the fecundating spermatozooids come in most cases from another cystid, the spermatozooids of the same cystids attaining maturity much sooner than the eggs [as in many plants]. The cystid produces the polypid by gemmation, and the polypid produces the larva by sexual generation. The same zoecium (cystid) can produce several polypids in succession, but the first are all sterile, and only the last fertile, and after the production of the larva, both cystid and polypid perish. The larva passes by metamorphosis into the zoecium; in *Alcyonidium*, *Sarcochitum*, and *Pedicellina*, the free larva already contains within itself a body homologous to the latter polypid. Arch. Z. expér. vi. pp. 193-280, pls. vi.-xiii. Preliminary notes in C. R. lxxxiv. pp. 723-725, and lxxxv. p. 406. Abstract in Ann. N. H. (4) xx. pp. 540 & 541.

KOREN & DANIELSEN, Faun. litt. Norveg. pt. iii., from observations made on some *Bugulidæ*, also come to the result that no colonial nervous system exists in the *Polyzoa*; they describe a peculiar system of muscles in each zoecium, by which, if several individuals are irritated at the same moment, the whole branch shows a movement.

HATSCHKE, *l. c.*, opposes the distinction of polypid and cystid as two distinct individuals, and urges the homology of the mesoderm and tentacles in the different subdivisions of the *Polyzoa*. The germinal strata of the bud are, according to him, throughout originally parts of the same strata (ectoderm, mesoderm, or endoderm of the mother); the larvæ of all *Cyclostomata* agree essentially in their structure with the larvæ of the *Endoprocta*, the fringe of cilia surrounding mouth and vent.

J. BARROIS has observed the development of a considerable number of genera [see *infra*], and deduces from these observations a general account of the development of the *Bryozoa*. According to him, the typical form of the larva is that of a gastrula, which exhibits two opposed faces separated by a circle of cilia (couronne); one of these faces is oval, having in its centre the mouth, and can be contracted into a kind of entry (vestibule), overlapped by the extension of the other or ab-oral face, which generally has a greater volume. All larvæ exhibit a middle layer (feuillet moyen), which is muscular or fatty, and is divided into an oral and an ab-oral part; the latter is more constant and voluminous, and constitutes the essential portion of the mesoderm; it is formed in most cases by a simple delamination of the ectoderm, but in the *Endoprocta* the intestine also appears to take part in its formation. The larvæ of the *Endoprocta* are differentiated from this common type by the development of three special organs for taction, which are originally portions of the mesoderm, but come into close relationship with the outside; the larvæ of the *Cyclostomata* by the development of the crown of cilia into a mantle-like expansion; the larvæ of the *Chilostomata* and *Cteno-*

stomata by the division of the ab-oral face into two parts, one of which acts as a sucker (ventouse). The transformation of the larva to the adult is in all cases by degeneration and succeeding new formation of the organs, the pretended direct transformation in the *Endoprocta* being an error of observation. But the degenerate fatty matter of the larva either rests inactive in the further course of development and is finally destroyed, or takes part in the new formation of the polypid, especially its wall and muscles. In the first case, the larval organization is quite transitional, and a strange aberrant link in the chain of development (theory of Allman and Nitsche); in the other, the mass of the two inner layers of the larva goes over into the two inner layers of the adult, though mingled and indirectly, and this proceeding may be termed a metamorphosis of the organs (theory of Ulianin). From this point of view, the oral face of the larva is homologous with the tentacular sheath of the adult; the intestine of the larva with that of the adult; the ab-oral face of the larva with the ectocyst; the vestibule of the larva (especially in the *Endoprocta*) with the intra-tentacular space of the adult; and the outside skin of the larva with the cup (calyce) of the adult. The curved form of the intestine in the *Polyzoa* results from closing the rim-like aperture of the digestive cavity of the embryo, and both orifices of the intestine are, in the first stage of all forms which have been observed, situated in the intra-tentacular space; it is only in the *Endoprocta* that this state continues also in the adult. The affinity of the *Polyzoa* to the *Rotifera* and the *Brachiopoda* is corroborated by the general history of their development.

E. RAY LANKESTER classifies the *Bryozoa* as a class of *Mollusca*, with the new name *Tentaculibranchia*, and subdivides them as follows:—

Branch A. *Holobranchia*; grade A. *Ectoprocta*; ord. 1, *Phylactolæma*
ord. 2, *Gymnolæma*
grade B. *Entoprocta*; ord., *Pedicellinea*

Branch B. *Pterobranchia*; ord., *Podostoma*; unique genus, *Rhabdopleura*.

Q. J. Micr. Sci. xvii. pp. 448.

32 species of *Polyzoa* collected off the coasts of Iceland and 16 off Labrador by Dr. Wallich are enumerated, those new or otherwise remarkable described, and their geographical distribution in the Arctic regions indicated, by T. HINCKS, Ann. N. H. (4) xix. pp. 97–112.

11 new species from the British coasts and 1 new to Britain described; *id. op. cit.* xx. pp. 212–218.

A list of 78 *Bryozoa* found at Roscoff, by L. JOLIET, Arch. Z. expér. vi. pp. 281–298. 22 among them are limited to the littoral zone between high and low water, 23 to deeper stations below the lowest tide, and 13 found in both zones.

A list of 32 *Polyzoa* collected by Capt. W. H. Cawne during a voyage to Australia and the Pacific, determined by Miss GATTY, P. Liverp. Soc. 1877, No. xxxi. pp. lxxii. & lxxiii. It is to be regretted that the localities for the individual species are not stated.

CHILOSTOMATA.

BICELLARIIDÆ.

Bugula flabellata (Thomps.) and *plumosa* (Pall.), *Bicellaria ciliata* (L.), and *Canda reptans* (L.). Development described and discussed by Barrois, *l. c.* pp. 178-193, pl. x; that of *Bugula flabellata* and *Bicellaria ciliata* also by Joliet, *Arch. Z. expér. vi. pl. viii. figs. 1-4, 8-11.*

Bugula avicularia (L.). Its colonies do not pass the winter; Joliet, *l. c. p. 289.*

Kinetoskias [*Cinetoscias*], *g. n.*, *K. smitti*, *sp. n.*, and *K. arborescens* (Danielsen) = *Bugula umbella* (Smitt), Norway; Koren & Danielsen, *Fauna litt. Norv. pt. iii.*

CELLULARIIDÆ.

Scrupocellaria. HINCKS states that in *S. reptans* two sorts of root-like projections are to be found, one terminating in a disk, fixed by adhesion to foreign objects, the other having hooked, anchor-like ends for fixation on Hydroids or Sponges; *Ann. N. H. (4) xx. pp. 218-220.* This has been observed in *S. scruposa* (L.) by Peach, *Nature*, June, 1877. On the development of the same, see Barrois, *l. c. p. 178, pl. iii.*

Eucratia chelata (L.) On its anatomy and development, see Joliet, *Arch. Z. expér. vi. p. 280, pl. viii. fig. 12, pl. ix. figs. 1-3.*

SALICORNARIIDÆ.

Salicornaria farciminoides (Ellis) and *sinuosa* (Hassall). Their identity confirmed by Joliet, *l. c. p. 287.*

MEMBRANIPORIDÆ.

T. HINCKS, *Ann. N. H. (4) xx. pp. 520-529*, proposes a new classification of the British species of this family, regarding chiefly the form of the zoœcia. He restricts the genus *Lepralia* (Johnst.) to the type of *L. pallasiana* (Johnst.); admits *Membraniporella* (Smitt), type *Lepralia nitida* (Johnst.), *Cribrilina* (Gray), type *L. radiata* (Moll.), *Escharella* (Smitt), type *L. reticulata* (Macg.), *Anarthropora* (Smitt) restricted, type *L. monodon* (Busk), *Micropora* (Gray), containing *Membranipora coriacea* (Esp.) and *L. complanata* (Norm.); and proposes the following new genera:—

Mucronella. Inferior margin of the aperture mucronate, a denticle within. Type, *Lepralia peachi* (Johnst.); p. 526.

Microporella. Inferior margin of the aperture straight and entire, a semilunate or circular pore below it. Type, *L. ciliata* (Pall.); p. 526.

Mastigophora. Inferior margin of the aperture straight, with a central sinus; one or more lateral vibracula. Type, *L. hyndmanni* (Johnst.); p. 527.

Schizoporella. Inferior margin of the aperture with a central sinus; avicularia usually lateral, sometimes median, with an acute or rounded mandible. Type, *L. unicornis* (Johnst.); p. 527.

Cylindroporella. Oral extremity produced, tubular, with a terminal orifice; an elevated pore on the front of the coll. Type, *L. tubulosa* (Norm.). *Op. cit.* xix. p. 101, pl. xi. fig. 8, and xx. p. 528.

Lagenipora. Colonies consisting of a number of cells immersed in a common calcareous crust; zoæcia decumbent, contiguous, the front wall solid; oral extremity produced, tubular, with a terminal orifice. *L. socialis*, sp. n. *Op. cit.* xx. pp. 214, 215, & 528, Hastings, on *Pecten maximus*.

Schizotheca. Zoæcia with a suborbicular primary aperture, the lower margin slightly sinuated; secondary aperture raised, tubular, notched or dentate in front; oo-œcium terminal, with a fissure in the front surface. Type, *Lepralia fissa* (Busk). *Tom. cit.* p. 528.

Rhynchopora. Inferior margin of the aperture supporting an uncinate process; a large avicularium placed transversely below the aperture; oo-œcium terminal, closed in front by a calcareous lamina. Type, *L. bispinosa* (Johnst.); p. 528.

Setosella. Vibracular cells alternating with the zoæcia throughout the colony; vibracula setiform. Type, *Membranipora vulnerata* (Busk); p. 529.

Megapora. Oral aperture trifoliate; oral valve composed of two portions, a fixed transversely elongate lamina and a moveable lip. Type, *L. ringens* (Busk); p. 529.

Membranipora pilosa (L.). The larvæ (*Cyphonautes*) and their metamorphosis described by J. Barrois, *l. c.* pp. 212-246, pls. xii.-xv. Some observations on *Cyphonautes* by Hatschek, *l. c.*

Membranipora cymbæformis [*cymbif.*] (= *spinifera*, Smitt, nec Johnst.), Hincks, Ann. N. H. (4) xix. p. 99, Iceland; *M. nodulosa, aurita*, and *fustroides*, id. *op. cit.* xx. p. 213, Great Britain; *M. spinosa*, Joliet, Arch. Z. expér. vi. p. 290, Roscoff: spp. nn.

MYRIOZOIDÆ.

Myrionozoum subgracile (Orb.), from Iceland; avicularia described by Hincks, Ann. N. H. (4) xix. pp. 106 & 107.

Mollia hyalina (L.). Larvæ and metamorphosis by Barrois, *l. c.* pp. 163-172, pl. ix.

Hippothoa flagellum (Manzoni) abundant on the British coasts; Hincks, *op. cit.* xx. p. 218.

ESCHARIDÆ.

Eschara foliacea (Pall.). White variety; Joliet, *l. c.* p. 291, Roscoff.

Lepralia pallasiana (Moll.), *ciliata* (Pall.), *spinifera* and *unicornis* (Johnst.), *Porella lævis* (Flem.). On their development; Barrois, *l. c.* pp. 134-158, pls. vii. & viii. Development of *L. granifera* (Johnst.); Joliet, *l. c.* pl. ix. figs. 5-8.

Lepralia marmorea, sp. n., Hincks, Ann. N. H. (4) xx. p. 214, Cornwall.

Lepralia martyi [-tii], sp. n., Joliet, *l. c.* p. 291, Roscoff.

Leprælia (sensu ampliore) *trispinosa* (Johnst.), var., = *Escharella jacotini*, forma *lamellosa* (Smitt), *porifera* (Smitt), *propinqua* (Smitt, as *Escharina*), *reticulato-punctata* and *radiatula*, spp. nn., all from Iceland, Hincks, Ann. N. H. (4) xix. pp. 100-104, pl. x. figs. 1-7, 9-14, pl. xi. fig. 1.

CELLEPORIDÆ.

Cellepora bilaminata, sp. n., Hincks, l. c. p. 111, pl. xi. figs. 6 & 7, Labrador; *C. ovata* and *plicata* (Smitt), Iceland, and *scabra* (Smitt), Labrador, *id.* l. c. p. 105 & 106, pl. xi. figs. 3-5, and p. 110.

RETEPORIDÆ.

Retepora wallichiana, sp. n. (Busk, MS.), = *cellulosa*, forma *notopachya*, var. *elongata* (Smitt), Iceland, Greenland, Spitzbergen, and Finmark; *id.* l. c. p. 107, pl. xi. figs. 9-13.

CYCLOSTOMATA.

Phalangella flabellaris (Johnst.). Development described by J. Barrois, l. c. pp. 57-88, pls. iii. & iv. *Tubulipora flabellaris* (Johnst.) [the same]: specimens from Iceland described by Hincks, Ann. N. H. (4) xix. p. 109.

CTENOSTOMATA.

T. HINCKS, Ann. N. H. (4) xx. pp. 529-532, proposes the following classification of the British species:—

Group 1. *Halcyonellea* (Ehrenberg). Zoarium fleshy; zoecia developed by budding from other zoecia.

Group 2. *Stolonifera* (Ehlers) = *Vesiculariidae* (Johnst.). Zoarium horny or membranous; zoecia developed by budding from the internodes of a distinct stolon or stem.

(a) *Orthonemida* (n.). Tentacles disposed in a perfect circle.

(aa) With a gizzard.

Fam. 1. *Vesiculariidae*: gen. *Vesicularia*, *Bowerbankia*, *Valkeria* (part), *Anathia*.

(bb) Without a gizzard.

Fam. 2. *Farrellidae*: gen. *Farrella*, *Avenella*, *Anguinella*.

Fam. 3. *Triticellidae*: gen. *Triticella* (Dalyell), ? *Hippuraria* (Busk).

(b) *Campylonemida* (n.). Tentacles not forming a perfect circle, two of the number being always everted. No gizzard.

Fam. 1. *Valkeriidae*: gen. *Valkeria* (Flem.).

Fam. 2. *Mimosellidae*: gen. *Mimosella* (Hincks).

Vesicularia cuscuta (L.) and *Serialaria lendigera* (L.). Free larvæ and metamorphosis described by J. Barrois, *op. cit.* pp. 199-209, pl. xi.; the

anatomical development of the former also by Joliet, *op. cit.* pl. ix. figs. 9 & 10.

Valkeria caudata, *citrina*, and *gracillima*, spp. nn., Hincks, Ann. N. H. (4) xx. pp. 215 & 216, Great Britain.

Serialaria convoluta (Lam.) found at Roscoff; Joliet, Arch. Z. expér. vi. p. 295.

Bowerbankia imbricata (Ad.). Notes on its development; *B. densa* is its young state. Joliet, *l. c.* p. 294, pl. viii. figs. 5-7, pl. ix. fig. 11.

Arachnidium clavatum, sp. n., Hincks, Ann. N. H. (4) xx. p. 216, Shetland, on Ascidians.

Lagenella nutans, sp. n., Joliet, *l. c.* p. 293, Roscoff.

Alcyonidium mytili (Hincks). Development described by J. Barrois, *op. cit.* pp. 105-126, pls. v. & vi. *A. hispidum* (Fabr.) by Joliet, *l. c.*

Alcyonidium disjunctum and *lineare*, spp. nn., Hincks, Ann. N. H. (4) xx. p. 217, Great Britain.

Sarcochitum polyoum (Hassall). On its development and colonies, observed at Roscoff; Joliet, *l. c.* p. 292.

Note on a Bryozoon enveloping dead shells inhabited by hermit crabs, like *Suberites* among the Sponges and *Hydractinia* among the Hydroid polyps, from Southern Africa; Martens, SB. nat. Fr. 1877, p. 183.

LOPHOPODA.

In the larva of *Alcyonella*, according to the observations made by H. Nitsche, the vent is first on the oral face inside the tentacles, as in the *Endoprocta*, and afterwards changes its position, as the circle of cilia is transformed into the horseshoe-shaped disposition of the tentacles. J. Barrois, *l. c.* pp. 89-92.

Cristatella. Observations on its development by Hatschek, *l. c.*

ENDOPROCTA.

The *Endoprocta* are, according to VOGT and HATSCHEK, *l. c.*, the prototypes, or lower, less differentiated form of the *Polyzoa*; according to JOLIET, *l. c.*, the most developed of them. SALENSKY, *l. c.*, comes to the conclusion that the origin of the buds is the same in both, and that the ectoderm of the *Endoprocta* corresponds to the zoëcium of the other *Polyzoa*, the intestine and tentacles to their polypid, and the parenchyma to the mesoderm.

Pedicellina echinata (Sars). Development observed and compared with the statements of other observers by J. BARROIS, *l. c.* pp. 25-49, 301 & 302, pl. ii. Description of budding and larva by W. SALENSKY, Ann. Sci. Nat. v. No. 3, p. 36; by B. HATSCHEK, Z. wiss. Zool. xxix. pp. 502-549, pls. xxviii.-xxx.; and by JOLIET, Arch. Z. expér. vi. pl. xiii. According to the last, *P. glabra* is the littoral variety of this species.

Loxosoma. Anatomy, development, and budding described by J. BARROIS, *l. c.* pp. 5-24, pl. i.; by W. SALENSKY, Ann. Sci. Nat. v. Nos. 3-5, 59 pp., pls. 12-15; and by C. VOGT, Arch. Z. expér. vi. pp. 305-357,

with 4 pls., full abstract in Q. J. Micr. Sci. (2) xvii. pp. 354-376, pl. xxii. The observations of these authors do not fully agree. Salensky confirms generally the statements made by H. NITSCHE [Zool. Rec. xii. p. 212]. He refutes O. Schmidt's determination that the so-called bud originates from an egg, and describes in the adult animal an organ of sense (a small elevation set with stiff hairs) which he compares with the so-called antenna of the *Rotifera*. O. Vogt states that the sexes are separate on different individuals, and describes the first formation of the egg and the origin of the bud out of the ectoderm; he compares the adult *Loxosoma* morphologically with *Pedicellina*, and states that it is chiefly distinguished by being vertically compressed, the tentacular crown placed on the ventral side, the more delicate substance of the body, and the solitary semi-parasitic life on Annelids, Sipunculids, &c. Vogt and Salensky agree in the statement that the number of tentacles increases in the same individual with age; from 12 to 18, according to the former. Vogt states that the species observed by himself had no pedal gland; Salensky points out that in two observed by him, it was wanting in the adult, but present in the young animal.

Loxosoma phascolosomatum, Vogt, l. c., Roscoff, attached to the caudal end of *Phascosoma*; *L. crassicauda* and *tethyæ*, Salensky, l. c. pp. 2-5, pl. xii. fig. 1, & pl. xiii. fig. 6, spp. nn., Naples, the first on the envelope of an Annelid, the other on a *Tethya*.

CRUSTACEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF MORE IMPORTANT PUBLICATIONS.

- ASPER, G. Die Muskulatur des Flusskrebse. Zürich: 1877.
- BATELLI, A. Di alcuni speciali produzioni dermiche in certi Crostacei brachiuri. Bull. Ent. Ital. 1877, pp. 84-91, pl. ii.
- BOECK, A. J. De Skandinaviske og Arktiske Amphipoder. Andet Hefte. Christiania: 1876, 4to, pp. 161-712, pls. viii.-xxxii., portrait.
- BRAUER, F. Beiträge zur Kenntniss der Phyllopoden. SB. Ak. Wien, lxxv. pp. 583-614, pls. i.-viii.
- BRAUN, M. Zur Kenntniss des Vorkommen der Speichel- und Kittdrüsen bei den Dekapoden. Arb. Inst. Würzb. iii. pp. 472-479, pl. xxi.
- BULLAR, J. The Generative Organs of the Parasitic *Isopoda*. J. Anat. Phys. xi. [1876] pp. 118-123, pl. iv.
- CLAUS, C. Zur Kenntniss des Baues und der Organisation der Polyphemiden. Denk. Ak. Wien, xxxvii. pp. 137-160, with 7 pls.
- GERSTÄCKER, A. Klassen und Ordnungen des Thierreichs. V. Arthropoden, pt. 22, pp. 1025-1088.
- GROBEN, C. Die Geschlechtsorgane von *Squilla mantis*. SB. Ak. Wien, lxxiv. pp. 389-406, with a plate.
- GRUBER, A., & WEISMANN, A. Ueber einige neue oder unvollkommen gekannte Daphniden. Ver. Ges. Freib. vii. pp. 50-116, pls. iii.-vii.
- HELLICH, B. Die Cladoceren Böhmens. Arch. Landesdurchf. Böhm. iii. section iv. pt. ii. 131 pp., large 8vo, with 70 woodcuts.
- Hesse* —. Description des Crustacés rares ou nouveaux des côtes de France. 21 article. Ann. Sci. Nat. (6) iv. [1876] art. 2, 48 pp. pls. vii.-ix.
- HESSE, —. Remarques sur le genre *Chalinus*. Ann. Sci. Nat. (6) v. No. 10.

- HESSE, —. Description des mâles, non encore connus, des *Lernanthropes* de Gisler et de Kroyer, ainsi que de la femelle d'une espèce nouvelle. *Rev. Montp.* vi. pp. 252-260, pl. iv.
- HOEK, P. P. O. VAN. Eerste bijdrage tot een nauwkeuriger kennis der sessile Cirripeden. (Academical dissertation.) Leyden: 1875, 94 pp. 2 pls. Also published in *Tijdschr. Nederl. Dierk. Ver.* ii. [1876] pp. 16-61, pl. i.
- Zur Entwicklungsgeschichte der Entomostraken. I. Embryologie von *Balanus*. *Niederl. Arch. Zool.* iii. [1876] pp. 47-83, pls. iii. & iv. II. Zur Embryologie der freilebenden Copepoden. *Op. cit.* iv. pp. 55-74, pls. v. & vi.
- De vrijlevende zoetwater-Copepoden der Nederlandsche Fauna. *Tijdschr. Nederl. Dierk. Ver.* iii. [1876] pp. 1-37, pl. i.-v. Nearly the same in German, in *Niederl. Arch. Zool.* iii. [1876] pp. 127-143, pls. vii.-ix.
- JOBERT, —. Recherches sur l'appareil respiratoire et le mode de respiration de certains Crustacés Brachyures. *Ann. Sci. Nat.* (6) iv. [1876] art. iii. 5 pp.
- KOSSMANN, R. Zoologische Ergebnisse einer Reise in die Küstengegenden des Rothen Meeres. III. *Crustacea*. Leipzig: 1877, 4to.
- KURZ, W. Studien über die Familie der Lernæopodiden. *Z. wiss. Zool.* xxix. pp. 380-428, pls. xxv.-xxvii.
- *Eunicicola clausii*, ein neuer Anneliden-parasit. *SB. Ak. Wien*, lxxv. pp. 21-28, pls. 1 & 2.
- LILLJEBORG, V. Synopsis Crustaceorum Succicorum ordinis Branchiopodorum[-dum] et subordinis Phylloporodorum[-dum]. *N. Act. Upsal.* (3) ix. A, 20 pp. (Also separately.)
- MAYER, P. Zur Entwicklungsgeschichte der Dekapoden. *Jen. Z. Nat.* xi. pp. 188-269, pls. xiii. & xiv.
- MIERS, E. J. Notes upon the Oxystomatous *Crustacea*. *Tr. L. S.* (2) i. pp. 235-249, pls. xxxviii.-xl.
- *Crustacea*, in *Zoology of the Transit of Venus Expedition*. London: 4to, 15 pp. pl. xi.*
- On *Acteomorpha*, a new genus of *Crustacea*. *J. L. S.* xiii. p. 183, pl. xiv.
- On a Collection of *Crustacea* made by the Rev. G. Brown on Duke of York Island. *P. Z. S.* 1877, pp. 133-138.
- On a Collection of *Crustacea*, *Decapoda*, and *Isopoda*, chiefly from South America, with descriptions of New Genera and Species. *L. c.* pp. 653-679, pls. lxvi.-lxix.
- List of the Species of *Crustacea* collected by the Rev. A. H. Eaton at Spitzbergen. *Ann. N. H.* (4) xix. pp. 131-140.

* As noted in *Mollusca*, p. 6, this is part of a vol. of *Phil. Trans.* not yet published.—ED.

- MIERS, E. J. Report on the *Crustacea* collected by the Naturalists of the Arctic Expedition in 1875-76. *Op. cit.* xx. pp. 52-66 & 96-110.
- NARDO, G. D. [died April 7, 1877]. Annotazioni illustranti cinquanta-quattro specie di Crostacei. Mem. Ist. Venet. xiv. [1869]. Also sold separately, 127 pp. 4 pls. 4to.
- PACKARD, A. S. Descriptions of new Phyllopod *Crustacea* from the West. Bull. U. S. Geol. Surv. iii. pp. 171-179.
- PARKER, T. J. On the Stomach of the Freshwater Crayfish. *J. Anat. Phys.* xi. [1876] pp. 54-60, pl. ii.
- PAULSON'S Treatise (Kiew: 1875) on exotic marine *Crustacea*, has not been seen by the Recorder.
- REICHENBACH, H. Die Embryonal-anlage und erste Entwicklung des Flusskrebsses. *Z. wiss. Zool.* xxix. pp. 123-196 & 263-266, pls. x.-xii.
- RICHIARDI, S. Intorno al *Peroderma cylindricum*. *Atti Soc. Tosc.* ii. fasc. 2, 12 pp. pl. vi.
- . Descrizione di cinque specie nuove del genere *Philichthys* ed una di *Sphaerifer*. *Op. cit.* iii. fasc. 1, 13 pp. pl. vi.
- . Descrizione die due specie nuove di *Lernæenicus*, con osservazione intorno ai generi *Lernæocera* e *Lernæonema*. *Tom. cit.* fasc. 1, 14 pp. pl. vii.
- . Dei Filictidi, osservazioni critiche e descrizione di sei specie nuove. *L. c.* 15 pp. pl. x.
- SCHMANKEWITSCH, W. [On some *Crustacea* of salt and freshwater lakes and their relations to the surrounding element.] In the Publications of the New Russian Society of Naturalists, iii. [1875] pt. 2, in Russian.
- . Zur Kenntniss des Einflusses der äussern Lebensbedingungen auf die Organisation der Thiere. *Z. wiss. Zool.* xxix. pp. 429-494.
(A part of the preceding paper, more elaborate and augmented, in German.)
- SCHÖDLER, J. E. Zur Naturgeschichte der Daphniden. Programm no. 77 der Dorotheenstädtischen Realschule. Berlin: 1877, 4to, 24 pp. 1 pl.
- SMITH, S. F. The early stages of *Hippa talpoidea*, with a note on the structure of the mandibles and maxillæ in *Hippa* and *Remipes*. *Tr. Conn. Ac.* iii. pp. 311-342, pls. xlv.-xlviii.
- TARGIONI-TOZZETTI, A. Crostacei Brachiuri, and Anomuri in "Zoologia del Viaggio intorno al Globo della R. pirosorvetta Magenta." Firenze: 1877, 8vo, 257 pp. 13 pls.
- VEJDovsky, F. Untersuchungen über die Anatomie und Metamorphose von *Tracheliastes polycolpus*. *Z. wiss. Zool.* xxix. pp. 15-46, pls. ii.-iv.

- VOGT, C. Recherches côtières. No. 1. De la famille des Philichthyes et en particulier du *Leposiphie* du *Labrax*, 41 pp. 2 pls. No. 2. Sur quelques Copepodes parasites à mâles pygmées habitant les poissons. 63 pp. 4 pls. Mém. Inst. Génév. xiii.
- WEISMANN, A. Beiträge zur Naturgeschichte der Daphnoiden, ii.-iv. Z. wiss. Zool. xxviii. pp. 93-254, pls. vii.-xi.
- . [See also GRUBER.]
- WIERZEJSKI, A. Ueber Schmarotzerkrebse von Cephalopoden. Z. wiss. Zool. xxix. pp. 562-582, pls. xxxii.-xxxiv.
- ZINONE, A. Studio sugli organi genitali maschili del *Pagurus prideauxii*. Napoli: 1877, 18 pp. 1 pl.

In Prof. HUXLEY's manual of the anatomy of invertebrated animals, the structure of the genera *Limulus*, *Chondracanthus*, *Apus*, *Lepas*, *Astacus*, *Carcinus*, *Mysis*, *Amphithoe*, *Cymothoa*, and *Squilla* are described as examples of the chief divisions of the *Crustacea*.

In the "Handbuch der Zoologie," edited by Dr. G. VON HAYEK at Vienna, the first part of the second volume, published at the close of 1877, discusses the *Crustacea*; a large number of woodcuts, copied from the principal authors, aid the student considerably in understanding the subject.

ANATOMY AND EMBRYOLOGY.

W. v. NATHUSIUS, in the work cited above (*Mollusca*, p. 5), pp. 33-45, pl. ii. fig. 15, treats also of the microscopical structure of the shield (carapace) of the *Crustacea*, chiefly of *Platycarcinus pagurus*, pl. ii. fig. 15, pl. iii. figs. 16 & 17 B, *Homarus vulgaris*, pl. iii. figs. 17 A & 19, pl. iv. fig. 20 A, *Astacus fluviatilis*, pl. iv. fig. 20 B, and endeavours to prove that it is not cuticular or formed by simple secretion, but composed of fibrillæ and really organized, yet not cellular.

Crustaceorubrin, giving an intense scarlet colouring to various *Crustacea* in deep water, such as *Gnatheuphausia*, *Petalophthalmus*, several Peneids and Caridids, and probably also *Pandarus*; spectral band in all the same. Moseley, Q. J. Micr. Sci. (2) xvii. p. 12, pl. ii. fig. 11.

The heart of the *Crustacea*, with regard to its structure and movements, is the subject of a paper by J. DOGIEL, Arch. Phys. 1877, pp. 401-408, with a plate. Ganglionic cells in the heart of the common crayfish described by E. BERGER, SB. Ak. Wien, lxxiv. pp. 422-424, with a plate.

The muscles of the common crayfish are described by G. ASPER in a separate treatise; "Die Muskulatur des Flusskrebse." Zurich: 1877.

The stomach of the same, and of the lobster and *Carcinus maenas*, described by T. J. Parker, J. Anat. Phys. xi. [1876] pp. 54-60, pl. ii.

G. F. TURSINI has made several experiments concerning the power of re-absorption in the intestine of some Decapod *Crustacea*, as *Maia*, *Dromia*, *Scyllarus*, and *Palinurus*, and comes to the result that solid particles of coal and carmine find their way through the chitinous mem-

brane of the intestine into the blood. Rend. Acc. Nap. xvi. pp. 95-99, with a plate.

Peculiar glands secreting a cement-like matter, by which the eggs are fixed to the abdominal feet, in *Astacus* and *Pagurus*, have been described by M. BRAUN; Arb. Inst. Würzb. iii. [1876] pp. 472-479, pl. xxi. He describes the salivary and cementary glands and their orifices, either in the œsophagus, labrum, or maxillæ of the former, in the post-abdomen itself or the post-abdominal feet of the latter, in 14 species of European Decapods and Stomapods, and gives a comparison of these two sorts of glands.

The structure of the compound eyes of some *Crustacea* is described by Prof. H. GRENACHER in a paper on the eye of the *Arthropoda*, published as an appendix to "Klinische Monatsblätter für Augenheilkunde," xv. May, 1877, p. 42, &c., with woodcuts. The crystalline cones are composed of four segments in the *Decapoda*, as in the *Insecta*, but in many *Amphipods*, *Isopods*, and *Schizopods*, only of two; in the *Daphniidæ* and *Estheriæ*, even of five segments. The "facettes" of the *Hyperidæ* are plain, not vaulted. In *Limulus* alone, the crystalline cones are not developed ("a-cone" eyes, the others "eu-cone").

J. CHATIN gives some notes on the eyes of the *Crustacea*. He regards the crystalline cone and the optic rod (bâtonnet) as two parts of one essentially homogeneous, light-refracting body, and points out distinct peculiar colours in the eyes of some *Crustacea*. Ann. Sci. Nat. (6) v. Zool. No. 9, 45 pp.

Several observations on the anatomy of the *Amphipoda*, chiefly the heart, the aorta, and the direction of the circulating fluid, also on the ganglionic cells and the termination of the nerves in the bristles of the maxillæ and palps, which are probably organs of tasting and hearing, by A. W. WRZESNIEWSKI, at the meeting of Russian naturalists at Warsaw, Sept., 1876; Z. wiss. Zool. xxviii. pp. 403 & 404.

The male sexual organs and the structure and development of the spermatozooids in *Pagurus prideauxi* described by A. ZINCONI, *suprà*, p. 4; no movement of the spermatozooids was observed.

The sexual organs of *Squilla mantis* (L.) are described by C. GROBBEN, SB. Ak. Wien, lxxiv. pp. 389-406, with a plate.

J. BULLAR makes the rather strange observation that in *Cymothoa*, *Nerocila*, and *Anilocra*, the sexes are not really, but only temporarily separate. In the first stage, they have the external appearance of males and a double penis with distinct orifice, and the internal male sexual organs filled with spermatozooids; but the same individuals contain also an ovary with an oviduct, which terminates in the sixth segment of the thorax, without external orifice. At the next moulting, the penis is lost, and neither the male nor the female sexual organs have an external orifice. At the third stage, they have a female orifice and produce eggs, and the male organs are reduced. J. Anat. Phys. xi. [1876] pp. 118-123, pl. iv.

H. N. MOSELEY remarks that possibly this may be an error, occasioned by spermatophores having been observed within the female, and taken for male organs; Ann. N. H. (4) xix. p. 89. BULLAR refutes this sup-

position, and adds some particulars concerning the development of the spermatozoa; *l. c.* pp. 254-256. MOSELEY persists in thinking the case very questionable, as the histological structure of the pretended testes is not described; *l. c.* pp. 310 & 311. [P. MAYER has since fully confirmed Bullar's views, as will be seen in the Record for 1878.]

W. J. SCHIMANKEWITSCH has continued and confirmed his researches upon the structural differences between specimens of the same species living in fresh or more or less saline water [*cf.* Zool. Rec. xii. pp. 228 & 229]; he has found these differences in the sensitive bristles of the antennæ, the spines of the post-abdomen, and in general colour and size, in *Daphnia rectirostris* (Leydig) and *Cyclops brevicaudatus* (Claus). Generally the saltwater form is the less developed, nearer to the juvenile state; one form can be arbitrarily changed into the other, by breeding in different water. In saline water, a species lives and multiplies at a low temperature, in which it would die if in fresh water. These observations were first made at the meeting of Russian naturalists at Kiew, Aug. 1871 (abstract in Z. wiss. Zool. xxii. 1872), and fully published in Russian in the publications of the New Russian Society of Naturalists, iii. part 2, in 1875; and in German in Z. wiss. Zool. xxix. pp. 429-494. See also *Artemia*, *Daphnia*, and *Cyclops* in the special part, *infra*.

EMBRYOLOGY.

P. MAYER has observed the first development of several *Decapoda*, chiefly of *Eupagurus prideauxi* (Leach), at Naples, and describes it minutely. The chief results are as follows:—The egg is originally a normal cell, originating from the epithelium of the ovary, but afterwards modified by deposition of deutoplasm within it and disappearance of the nucleus; very probably it is fecundated within the ovary; it has only one cover when leaving the body of the mother, then one, two, four, and eight nuclei make their appearance within it before the outside division begins. At about the eighth division, the nutritive part of the vitellus, consisting chiefly of deutoplasm, begins to be enveloped by a continuous stratum of blastoderm secreting a chitinous layer, which may be considered as the first moulting. The egg increases in size during the development of the embryo in all *Decapoda*. The embryos of all genera observed by the author have the form which has been called "perimorula;" this is changed by invagination in the midst of the germinal disk into a "gastrula," but the anterior part of the head takes its origin independently of the germinal disk from a pair of protuberances, which are afterwards united. The mouth of the gastrula becomes the vent of the later animal, and the whole invagination the posterior part of the intestine; whereas the later mouth and the anterior part of the intestine are formed very late, and do not at first communicate with the stomach. The mesoderm is derived from the ectoderm; the endoderm is secreted by the cells in the bottom of the gastrula, and is formed later than the mesoderm. In the dorsal part of the embryo, parts of the yolk remain unchanged for rather a long time. Finally, the author calls attention to the number of bristles at the end of the tail in the Zœa-stage; he states it to be nor-

mally seven, but increased or diminished in several genera, and he thinks this number to be important for making out the "phylogeny" of the various *Decapoda*. Jen. Z. Nat. xi. pp. 187-296, pls. xiii.-xv.

The first stages of development in the egg of the common crayfish are described by H. REICHENBACH, Z. wiss. Zool. xxix. pp. 123-166, pls. x.-xvii.; recapitulation of the chief results, pp. 167-171; comparison with the statements of other authors, and the development of other *Articulata*, pp. 171-191. Abstract by P. Mayer in JB. Anat. Phys. vi. pp. 162 & 163. In an appendix, pp. 263-266, the author states that his observations on the crayfish agree generally as to facts with those made by P. Mayer in *Eupagurus prideauxi*, but that his interpretation is in many particulars different; he tries to reconcile some of these differences.

F. MÜLLER, referring to a doubt expressed by Spence Bate, maintains his view that the Nauplius described by himself in 1863 is really the larva of *Pencus*; although neither the transformation in the same individual, nor the origin from the egg of a *Pencus*, has been actually observed, the single forms, which have been observed, are so closely linked as to form a nearly continuous series, and no known Crustacean of any other family can with any probability be supposed to be the adult form of them. Z. wiss. Zool. xxx. pp. 163-166.

The development within the egg of *Cyclops*, *Diaptomus*, *Temora*, and *Canthocamptus* is described by P. P. C. HOEK, Niederl. Arch. Zool. iv. pp. 55-74, pls. v. & vi. Concerning the genital organs, the statements of Prof. Claus are generally confirmed. The Gastrula, the orifice of which becomes also here the vent of the adult animal, and the Nauplius stage are described.

The formation of the eggs in *Balanus* in the ovary and the structure of its Nauplius-stage is described in Dutch by HOEK in an Academical dissertation (Leiden: 1875), and also in German in Niederl. Arch. Zool. iii. [1876] pp. 47-83, pls. iii. & iv.

CONTRIBUTIONS TO FAUNAS.

Palæarctic Freshwater Crustacea.

The *Phyllopoda* living in Sweden and neighbouring northern regions are enumerated by V. LILLJEBORG, N. Act. Upsal. (3) ix. A, 20 pp. The species will be mentioned below. The most northern of them is *Apus glacialis* (Kröyer) found in Spitzbergen, Beeren Island, Greenland, Nova Zembla, and Lapland.

Gammarus pulex found in lakes of the Tundra, near Doudino, Siberia, at 69° N. lat., and *Idotea entomon* (dead specimen) on the banks of the Yenissei River in the same latitude; H. Théel, Relation de l'expédition Suédoise de 1876 au Yenissei, Upsala: 1877, p. 33.

Ninety-six species of *Cladocera* observed in Bohemia are enumerated and described by B. HELLICH, Arch. Landesdurchf. Böhm. iii. sect. iv. pt. ii.; they belong to the following families:—*Sididae* 4 spp., *Holopedidae* 1, *Daphnidae* 39, *Bosminidae* 5, *Lyncodaphnidae* 8, *Lynceidae* 37, *Poly-*

phemidæ 1, *Leptodoridae* 1. Forty-two of them are also British species. Most of the species are illustrated by woodcuts, representing either the whole animal, or more often some characteristic parts of it. The new species will be mentioned below. Some general remarks concerning their occurrence and manner of life, as well as their geographical distribution, are given at the end of the paper. The recorded species of Bohemia are more than those known in any other country, but there is not much difference in the prevailing genera and species between that part of Europe and Russia, Sweden, Denmark, Germany, or England.

The *Cyclopidae* living in Holland are enumerated by P. P. C. HOEK, Tijdschr. Nederl. dierk. Ver. iii. [1876], pp. 1-37, pls. i.-v., and Niederl. Arch. Zool. iii. [1876] pp. 127-163, pls. vii.-ix. In the former, two species living in cisterns, *Cyclops brevicaudatus* (Claus) and *bicuspidatus* (Claus), are fully described.

Palemon serratus (Penn.) abundant in the rivers Tejo and Sado, *Astacus fluviatilis* not mentioned as Portuguese; Brito Capello, J. Sci. Lisb. vi. p. 79.

Fauna of Lakes.

F. A. FOREL makes some general remarks on the subdivisions and origin of the fauna of the lakes in Switzerland, distinguishing (1) the littoral fauna, (2) the pelagic near the surface of the open water, and (3) the fauna of the depths. A. WEISMANN points out that the pelagic *Crustacea* of the lakes have eyes which are adapted to a small degree of light, and therefore keep during the daytime at a great depth, and at night or twilight near the surface. Ber. Vers. Naturf. (Munich) 1877, pp. 172 & 173. See also *Niphargus* (*Gammuridae*) in the special part.

Lake of Constance. Notes on its *Crustacea*, chiefly *Entomostraca* near the surface far from the banks and those living in deep water, by A. WEISMANN in his pamphlet, "Das Thierleben im Bodensee," sep. print from "Schriften zur Geschichte des Bodensees," pt. vii. pp. 11-17, with figures of some remarkable species.

Note on some *Cladocera* found in the lake of Gmunden in Austria by Claus, Denk. Ak. Wien, xxxvii. p. 137.

Foreign Land or Freshwater Crustacea.

Species of crayfish in Indiana; Bundy, P. Ac. Philad. 1877, pp. 171-173.

Several new species of *Oniscidae* from South America and Eastern Asia, freshwater *Palemon* from South America, and freshwater *Cymothoidæ* from North eastern Asia described by MIERS, P. Z. S. 1877, pp. 660-676.

Palemon ohionis, sp. n., in Ohio river, see *infra*.

Notes on Australian *Cladocera* by SCHGEDLER, SB. nat. Fr. 1877, pp. 11-14; one, *Simocephalus vetulus* (Müll.), is identical with a common European species.

Northern Sea.

Spitzbergen. List of 7 Decapods, 1 Isopod, 15 Amphipods including *Caprella*, 1 Cirriped (and 2 Pycnogonids) collected by A. E. Eaton at

Spitzbergen in the summer, by E. J. MIERS, Ann. N. H. (4) xix. pp. 131-140. Only one Brachyure is among them, *Hyas araneus* (L.)

Smith Sound and coasts of *Grinnell Land*, north of lat. 78° N. : 9 species of Macrura, 1 Stomatopod, 4 Isopoda, 12 Amphipoda, 1 Phyllopod, 1 Copepod, 1 Cirriped (and 2 *Pycnogonida*) collected by Feilden and Hart during the Arctic Expedition of 1875-76, enumerated by E. J. MIERS, Ann. N. H. (4) xx. pp. 52-66 & 96-110.

White Sea. Notes on its rich marine fauna, chiefly in Amphipods, but also Isopods and Decapods, by Prof. WAGNER at the meeting of Russian naturalists at Warsaw, Sept. 1876 (Z. wiss. Zool. xxviii. p. 385).

Calanus finmarchicus (Müll.) [*Temora*], principal food of the herring, and *Anomolocera pattersoni* (Templ.) [*Irenaeus*], principal food of the mackerel, both in immense numbers in the sea between Norway and Iceland ; G. O. Sars, report on the Norwegian expedition in 1876, extract in Circular des deutschen Fischerei-Vereins, 1877, pp. 28 & 29.

The known species of *Cirripedia* living on the Dutch coast are enumerated by P. P. C. Hoek in an academical dissertation published at Leiden in 1875, and also in Tijdschr. Nederl. dierk. Ver. ii. [1876], pp. 16-61, pl. i. They are 4 species of *Balanus*, including *B. improvisus* (Darwin), in channels of brackish water at Amsterdam and Leiden, 1 *Verruca* and 2 *Lepas* ; *Balanus tintinnabulum* (L.) and *Conchoderma auritum* (L.) have been occasionally found on ships.

Seas of Southern Europe.

Portugal. F. DE BRITO CAPELLO has given a supplement to his list of Portuguese *Crustacea Decapoda* [see Zool. Rec. xii. p. 217] containing some new species, J. Sci. Lisb. v. [1876] No. 18, pp. 121-127. The same author publishes a new list of Portuguese *Crustacea*, tom. cit. (No. 20) pp. 264-274, and op. cit. vi. (No. 21) pp. 74-80, also containing only the *Decapoda*. In both papers, some new species are described.

Here may be mentioned a work published by the late G. D. NARDO in 1869, hitherto not included in Zool. Rec. It is contained in the Memorie dell' Istituto Veneto delle scienze, vol. xiv. and treats on the *Crustacea* of the Adriatic Sea, giving first a copious record of all previous publications bearing on this subject and then proceeding to determine and describe in systematic order the drawings of Adriatic *Crustacea*, drawn by S. CHIEREGHINI at the beginning of this century, but never published. They appear to contain some new species, and even [doubtful] new genera ; the figures are copied from the drawings.

J. D. CATTÀ notes several *Amphipoda* observed in the Gulf of Mar-seilles, some only known hitherto from the northern seas, e.g., *Microdeutopus anomalus* (Rathke), *Ampelisca belliana* (Sp. Bate), and *Leucothoe articulosa* (Mont.). Rev. Montp. iv. [1875, Sept.].

Indian and Australian Seas.

R. KOSSMANN describes and discusses a number of *Crustacea*, chiefly *Brachyura* and *Copepoda*, collected by himself on the shores of the Red

Sea, with particular attention to the variability of the species. Zool. Ergebnisse, iii.

A. TARGIONI-TOZZETTI describes several *Brachyura* and *Anomura* from Java, Sumatra, Borneo, and Australia, a few of them new; Crostacei in Zoologia della Magenta, pt. i.

15 species of *Brachyura* and 1 of *Macrura* from Duke of York Island, collected by Rev. G. Brown, mostly well-known Indian forms, enumerated and discussed by E. J. MIERS, P. Z. S. 1877, pp. 133-138.

New Caledonia. Two of A. MILNE-EDWARDS's important papers on the Crustacea of New Caledonia, N. Arch. Mus. viii. [1872], pp. 228-267, pls. x.-xiv., and ix. [1873] pp. 155-332, pls. iv.-xviii., have been omitted in former Records: the new species will be noticed *infra*; many more, already known, are described and figured, and their synonymy corrected.

16 species of Decapods collected in Shark's Bay, Western Australia, by Mr. Perry, enumerated by MIERS, Tr. L. S. (2) i. p. 238, footnote.

Kerguelen Island. 15 species of Crustacea enumerated, some new, others more widely distributed in the Antarctic province, as *Halicarcinus planatus* (F.) and *Spharoma gigas* (Leach), also in Patagonia and New Zealand, *Serolis latifrons* (White), New Zealand and Aucklands, *Jara pubescens* (Dana), and *Cassidina emarginata* (Guérin), Falklands. MIERS, Crust. in Transit of Venus Expedition. No terrestrial species has been found [*suprà*, p. 2, note].

Some notes on marine Crustacea found at Kerguelen Island, and in the Antarctic Sea, by the late R. VON WILLEMOES-SUHM, Z. wiss. Zool. pp. cxxii. & cxxix.

Pacific.

California. W. N. LOCKINGTON has described a number of new species of Decapoda; P. Cal. Ac. Feb.-May, July & Sept. 1876. T. H. STREETS & J. S. KINGSLEY have examined the types and recognized several of them to be known species; Bull. Essex Inst. ix. pp. 103-108.

Japan and China. Targioni-Tozzetti, *l. c.*, describes several *Brachyura* from Yokohama and Woosung, nearly all already known by Haan.

Galapagos. *Leptodius cooksoni*, sp. n., *Grapsus pictus* (Latr.), *Remipes pacificus* (Dana), and *Cubaris galapagoensis*, sp. n., collected by Comm. Cookson; MIERS, P. Z. S. 1877, pp. 73 & 74, pl. xii.

Peru and Chili. Some known species described by TARGIONI-TOZZETTI, *l. c.*

DECAPODA.

BRACHYURA.

OXYRRHYNCHA.

Inachus aguiarii, sp. n., Brit. Capello, J. Sci. Lisb. v. [1876], p. 265, Setubal.

Inachodes hemphilli and *brevirostrum*, spp. nn., Lockington, P. Cal. Ac. 1876, July. Apparently distinct species; Streets & Kingsley, Bull. Ess. Inst. ix. p. 105.

Eurypodius latreillii and *audouini* (M.-Edw.), Valparaiso, described by Targioni-Tozzetti, Crostac. Magenta, pp. 9-17, pl. i. figs. 1-3, 7, 9, & 12-21.

Trichoplatus, g. n. Maxillipeds covered with small scales, their third joint notched as in *Daira*; in other characters, allied to *Eurypodius* and *Halimus*. *T. huttoni*, sp. n., A. Milne-Edwards, Ann. Sci. Nat. (6) iv. [1876] art. 9, pp. 1-3, pl. x., New Zealand.

Epialtus minimus, sp. n., Lockington, P. Cal. Ac. 1876, July. *E. dentatus* (M.-Edw.): specimens from Western Patagonia and Valparaiso, described by Targioni-Tozzetti, Crostac. Magenta, pp. 18-21, pl. ii. figs. 1, 2, 5, 6, & 11.

Ala spinosa, g. & sp. nn., Lockington, P. Cal. Ac. 1876, July; = *Anaptychus cornutus* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 105.

Pisa intermedia, sp. n., Nardo, Annot. Crostac. p. 73, pl. i. fig. 3, Adriatic. Notes on *P. armata* (Latr.), *gibbsii* (Leach) = *coccinea* (Nardo, olim), pl. i. fig. 5, and *nodipes* (Leach), all Adriatic; *id. l. c.* pp. 69-73.

Pisoides? celatus, sp. n., Lockington, P. Cal. Ac. 1876, July; = *Microphrys platysoma* (M. E.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 103.

Fisheria depressa (g. ? &) sp. n., Lockington, P. Cal. Ac. 1876, July; is a new species of *Microphrys*, Streets & Kingsley, Bull. Essex Inst. ix. p. 103.

Lepidonaxia, g. n. "Rostrum bifidum, cornubus acutis acute divergentibus, corpore brevioribus. Orbita labio superne subdilatato, inermi, postice incisio, inferne late hianti; antennæ proximæ margini clauso. Antennarum basis lateraliter rostro subexserta, margine externo dilatata, inermis, postice medioque unidentata. Hectoischionathitis elongata, margine interno denticulata. Pedes secundi tertiis longiores, omnes graciles subteretes breves, tarso inferne spinuloso." *L. defilippii*, sp. n., Java, Targioni-Tozzetti, Crostac. Magenta, p. 5, pl. i. figs. 4-6, 8, 10, & 11.

Acanthophrys filholi, sp. n., A. Milne-Edwards, Ann. Sci. Nat. (6) iv. [1876] art. 9, p. 4, Stewart Islands.

Picrocerus armatus (M. E.), figured, *id.* N. Arch. Mus. viii. [1872] pl. xiii.

Cyclomaia margaritata, sp. n., *id. l. c.* p. 236, pl. x. figs. 2 & 3, New Caledonia.

Platypes edentata, g. ? & sp. nn., Lockington, P. Cal. Ac. 1876, March; = *Thoe sulcata* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 104.

Mithrax areolatus, sp. n., Lockington, P. Cal. Ac. 1876, July; is a *Mithraculus*, Streets & Kingsley, *l. c.*

Mithrax, subg. *Schizophrys*, table of known species, *asper* and *dichotomus* (M. E.), united into one species named *triangularis*, with the varieties *africanus* and *indica* [sic!]; Kossmann, *l. c.* pp. 11-14.

Maia squinado (Hbst.), young; Nardo, Annot. Crostac. p. 75, pl. i. fig. 4.

Micippe. Table of the known species and *M. philyra* (Hbst.), var. n. *mascarenica*, *M. thalia* (Hbst.) [nec Hbst., which, according to the original specimen in the Berlin Museum, belongs to *Criocarcinus*; but *thalia*, De Haan, = *miliaris* (Gerst.)], varr. nn. *caledonica* and *indica*, Kossmann, *l. c.* pp. 4-8, pl. iii. figs. 1-5. *M. ovata*, sp. n., Lockington,

P. Cal. Ac. 1876, July; = *Othonia picteti* (Saussure), Streets & Kingsley, Bull. Ess. Inst. ix. p. 104.

Hyastenus oryx, sp. n., New Caledonia, and enumeration of all known species, A. Milne-Edwards, N. Arch. Mus. viii. [1872] p. 250, pl. xiv. fig. 1. *Menetius*. Many synonyms of *monoceros* (Latr.), *id. l. c.* p. 253.

Stilbognathus erythræus (Martens), figured by Kossmann, *l. c.* p. 15, pl. i. fig. 1.

Acanthonyx elongatus, sp. n., Miers, P. Z. S. 1877, p. 673, pl. lxix. fig. 1; *A. petiveri* (M. E.) ?, from Peru, *id. l. c.* p. 654.

Ceratocarcinus dilatatus, sp. n., A. Milne-Edwards, *l. c.* p. 256, New Caledonia.

Lambrus sculptus and *affinis*, spp. nn., *id. l. c.* pp. 258 & 261, pl. xiv. figs. 3 & 4, New Caledonia.

CANCRIDE.

Note on the affinity and distinction of the genera *Actæa* and *Actæodes*, and the subfamilies *Xanthinæ* and *Chlorodinæ*; Miers, P. Z. S. 1877, p. 134. Note on the arrangement of the genera *Carpilius*, *Atergatis*, *Liomera*, *Actæa*, and *Euxanthus*; Kossmann, Zool. Ergebn. Reis. Roth. Meer, Crust. p. 16-19.

Carpilius convexus (Forsk.), from Duke of York Island, sexual differences; Miers, P. Z. S. 1877, p. 133.

Carpilodes levis, *monticulosus*, and *margaritatus*, spp. nn., A. Milne-Edwards, N. Arch. Mus. ix. [1873] pp. 178-182, pl. v. figs. 1-3, New Caledonia.

Atergatis montrouzieri, sp. n., *id. l. c.* p. 186, pl. v. fig. 5, New Caledonia.

Atergatis roseus[-a] (Rüpp.) var. n. *rueppelli*, *scrobiculatus*[-a], and *alba*, Kossmann, Zool. Ergebn., Crust. pp. 19-21, Red Sea.

Atergatis floridus[-a] (L.), from Pulo Condore; Targioni-Tozzetti, Crostac. Magenta, p. 24, pl. ii. figs. 10, 13, & 16.

Atergatis cristatissima, sp. n., Lockington, P. Cal. Ac. 1876, March; = *A. rotundata* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 105.

Lophactæa actæoides (M.-E. as *Lophozozymus*), A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 189, pl. vi. fig. 7, New Caledonia.

Lophactæa helleri, sp. n., Kossmann, *l. c.* p. 21, pl. i. fig. 2, Red Sea.

Actæa. List of the known species, including *Actæodes*; Targioni-Tozzetti, Crostac. Magenta, pp. 31-35.

Actæa hirsutissima (Rüpp.), *rugipes* (Heller), and *savignii* (M. E.) = *granulata* (Andouin), compared and criticised by Kossmann, *l. c.* pp. 23-26, pl. iii. figs. 7-9. The first of them also described by Targioni-Tozzetti, Crostac. Magenta, pp. 37-42, pl. iii. figs. 26-31.

Actæodes tomentosus (M. E.), from Duke of York Island, Miers, P. Z. S. 1877, p. 134; the same, as *Actæa*, described by Targioni-Tozzetti, Crostac. Magenta, pp. 35-37, pl. iii. figs. 14-25.

Actæodes mexicanus, sp. n., Lockington, P. Cal. Ac. 1876, May; = *Xanthodius sternbergi* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 105.

Psaumis, g. n., distinguished from *Actea* by the external antennæ, which do not reach the post-orbital margin. *P. fossulata* (Girard, as *Actea*) and *glabra*, sp. n., Kossmann, l. c. pp. 26-28, pl. i. figs. 3 & 4, & pl. iii. figs. 10 & 11, Red Sea.

Actumnus pugilator, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 195, pl. vii. fig. 1, New Caledonia.

Liomera edwardsi, Kossmann, l. c. p. 28, Red Sea.

Euxanthus melissa (Herbst), Targioni-Tozzetti, Crostac. Magenta, p. 27, pl. iii. figs. 1-7.

Xantho poressa (Olivi, 1792), from the Adriatic, distinguished from *florida* (Leach) by Nardo, Annot. Crostac. pp. 78-80, both figured, pl. i. figs. 1 & 2.

Xantho spinituberculatus[-a], sp. n., Lockington, P. Cal. Ac. 1876, Feb.; = *Xanthodes taylori* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 105.

Xantho planus[-a] (M. E.), from Callao; Targioni-Tozzetti, Crostac. Magenta, p. 25, pl. ii. figs. 14 & 20.

Epixanthus rugosus, sp. n., Kossmann, Zool. Ergebn. Crust. p. 36, Red Sea.

Panopeus purpureus and *transversus*, spp. nn., Lockington, P. Cal. Ac. 1876, Sept.; are distinct species, Streets & Kingsley, Bull. Ess. Inst. ix. pp. 105 & 106.

Chlorodius miliaris and *sculptus*, spp. nn., A. Milne-Edwards, N. Arch. Mus. ix. [1873] pp. 216 & 217, pl. viii. figs. 3 & 4, New Caledonia.

Chlorodius fisheri, Lockington, P. Cal. Ac. 1876, Sept.; *C. rufescens* and *exiguus*, Java and Sumatra, Targioni-Tozzetti, Crostac. Magenta, pp. 43-50, pl. iv. figs. 1-8: spp. nn.

Chlorodius (*Leptodius*) *excavatus* (M. E.), including *sanguineus* (M. E.) and *edwardsi* (Heller), and *C. (Phymodius) niger* (Forsk.), including *cytherea* and *nebulosus* (Dana), *depressus* (Heller), and *hirtipes* (Ad. & White), both very variable; Kossmann, l. c. pp. 32-35, the first figured in six varieties of colour, pl. ii. figs. 1-6.

Leptodius exaratus, var. *sanguineus* (M. E.), = *Chlorodius nodosus* (Randall), Duke of York Island; Miers, P. Z. S. 1877, p. 134.

Leptodius cooksoni, sp. n., *id.* l. c. p. 73, pl. xii. fig. 1, Galapagos Islands.

Pilodius granulatus, sp. n., Targioni-Tozzetti, Crostac. Magenta, pp. 50-54, pl. iv. figs. 14 & 16-18, probably from the Red Sea.

Chlorodopsis, g. n., near *Pilodius*; inner angle of the orbit occupied by a basilar projection of the outer antenna, as in *Etisus*. *C. melanochirus* and *melanodactylus*, spp. nn., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 227, pl. viii. figs. 5-8. *Chlorodius arcuolatus* (M. E.) and *Pilodius spinipes* (Heller) also belong to this genus; *id. ibid.*

Epixanthus corrosus, sp. n., *id.* l. c. p. 241, pl. ix. fig. 1, New Caledonia.

Etisus lavimanus (Randall), specimens from the Red Sea, somewhat different from the type; Kossmann, l. c. pp. 30 & 31. Described by Targioni-Tozzetti, Crostac. Magenta, pp. 29 & 30.

Elisodes rhynchophorus, sp. n., A. Milne-Edwards, N. Arch. Mus. viii. [1872] p. 235, locality unknown.

Pilumnus caeruleus, *barbatus*, *cursor*, *longipes*, *purpureus*, *actumnoides*, *vermiculatus*, *nitidus*, and *cristimanus*, spp. nn., *id. op. cit.* ix. [1873] pp. 242-252, pls. ix. & x., New Caledonia.

Pilumnus (Leach) divided into three sub-genera: *Parapilumnus*, no orbital slit, *Pilumnus*, s. str., one orbital slit, and *Eupilumnus*, two orbital slits; Kossmann, *l. c.* p. 37.

Pilumnus tridentatus [Maitland, see Zool. Rec. xiii. Crust. p. 6] found in brackish water near Amsterdam; Hoek, Tijdschr. Ned. Dierk. Ver. ii. [1876], p. 243, pl. xiv. figs. 12-16.

Pilumnus affinis and *teiclerianus*, spp. nn., Brito Capello, J. Sci. Lish. v. [1876], pp. 121 & 122, Setubal, Coast of Portugal.

Pilumnus estuarii, sp. n., Nardo, Annot. Crostac. pp. 81-84, pl. i. fig. 6, Venice.

Pilumnus brachytrichus, sp. n., perhaps = *tomentosus* (M. E.), Kossmann, *l. c.* pp. 37 & 39, Red Sea.

Pilumnus vesperilio (Leach) described by Targioni-Tozzetti, Crostac. Magenta, p. 55, pl. iv. figs. 25, 27, & 32.

Actumnus tomentosus (Dana), from Java, *id. l. c.* pp. 56-60, pl. iv. figs. 22-24, 26, & 29.

Heteractæa pilosa, g. ? & sp. n., Lockington, P. Cal. Ac. 1876, Sept.; = *Pilumnus lanatus* (M. E. & Luc.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 106.

Acanthus spino-hirsutus, g. & sp. nn., Lockington, P. Cal. Ac. 1876, Feb.; belongs without doubt to *Pilumnus*, Streets & Kingsley, *l. c.* p. 107.

Eriphia longicrura[-is] (Nardo, 1868), Nardo, Annot. Crostac. p. 86, pl. ii. fig. 1, Adriatic.

Eriphia levimana (Latr.), Duke of York Island, note on the younger specimens; Miers, P. Z. S. 1877, p. 135. Specimen from Sumatra described by Targioni-Tozzetti, Crostac. Magenta, pp. 60-62, pl. v. fig. 1.

Trapezia. All species, except perhaps *digitalis*, Latr. (*leucodactyla*, Rüpp.), united by Kossmann, *l. c.* pp. 41-45.

Trapezia dentata (Dana), from Java; Targioni-Tozzetti, Crostac. Magenta, pp. 63 & 64, pl. v. fig. 2.

Trapezia latifrons, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 259, pl. x. fig. 7, New Caledonia.

Hexapus (Dana) *seapes* (Fabr.) to be placed near *Trapezia*; *id. l. c.* p. 253, pl. xii. fig. 1.

PORTUNIDÆ.

General observations concerning the form of the cephalothorax in this family, compared with the *Cancridæ*; Targioni-Tozzetti, Crostac. Magenta, pp. 86-90.

Lupa. List of known species; *L. pelagica* (L.) and *sanguinolenta* (F.) described. *Id. l. c.* pp. 66-70, pl. v. fig. 3.

Neptunus anceps (Saussure), from Martinique; differences from *N. forceps* (F.) pointed out; Miers, P. Z. S. 1877, p. 656.

Thalamita and *Goniosoma*. List of known species by Targioni-Tozzetti, *l. c.* pp. 85 & 86.

Thalamita prymna (Hbst.), *crenata* (Rüpp.), *cæruleipes* (Jacq.), *crassimana* and *spinimana* (Dana), *picta* and *dancæ* (Stimps.), united by Kossmann, *l. c.* pp. 47-49. *T. stimpsoni* (M. E.), *cæruleipes* (Jacq.), and *sima* (M.-E.), described by Targioni-Tozzetti, *l. c.* pp. 71-81, pl. v. figs. 4 & 5, pl. vi. fig. 1.

Amphitrite paucispinis, sp. n., Lockington, P. Cal. Ac. 1876, Sept.; probably = *Achelous panamensis* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 107.

Goniosoma cruciferum (Fabr.) and *affine* (Dana), Java and Singapore, Targioni-Tozzetti, *l. c.* pp. 82-84, pl. vi. figs. 2 & 3.

Xiphonectes, g. n., lateral teeth of the cephalothorax fewer than 9, the last very long. *X. leptochelæ*, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] pp. 157-159, pl. iv. fig. 1, New Caledonia. *Amphitrite vigilans* and *longispinosa* (Dana) also belong to this genus.

Thalamonyx, g. n., near *Goniosoma*, front entire, lateral teeth 5, the three last segments of the sternum with marked median suture. *T. gracilipes*, sp. n., *id. l. c.* p. 168, pl. iv. fig. 3, New Caledonia.

Caphyra (Guérin), *lævis* (M.-E., as *Goniosoma*), *id. l. c.* p. 172, pl. iv. fig. 4.

GEARCINIDÆ.

The respiratory cavity beneath the dorsal shield in the genera *Uca*, *Cardisoma* (and *Gelasimus*) really contains air, and is provided with a double system of blood-vessels; the chitinous membrane which separates it from the visceral cavity can be moved in a lateral direction, and this movement is for expelling and renewing the air in the respiratory cavity. JOBERT, Ann. Sci. Nat. (6) iv. [1876] art. 3, pp. 1-5.

Cardisoma carnifex (Hbst.), from Duke of York Island; Miers, P. Z. S. 1877, p. 137. Habits of the same in New Caledonia; A. Milne-Edwards, N. Arch. Mus. ix. pp. 264-266.

TELPHUSIDÆ.

Geotelphusa dehaani (Stimps.) described; Targioni-Tozzetti, Crostac. Magenta, p. 91.

Paratelphusa tridentata (M. E.) described; *id. l. c.* p. 93, pl. vi. fig. 4.

OCTYPODIDÆ.

Ocypode ceratophthalma (Pall.), Duke of York Island; variation in length of the ocular horns. Miers, P. Z. S. 1877, p. 135.

Ocypode cordimana (Latr.) described by Targioni-Tozzetti, Crostac. Magenta, pp. 108-110, pl. vii. fig. 3.

Gelasimus. Critical notes on the known species. *G. tetragonon* 1877. [VOL. XIV.] B 16

(Hbst.), var. n. *spiniarpa*, and *annulipes* (M. E.), var. n. *alvimana*, Red Sea. Kossmann, l. c. pp. 51-53.

Gelasimus coarctatus and *triangularis*, spp. nn., A. Milne-Edwards, N. Arch. Mus. ix. [1873] pp. 272 & 275, the first pl. xii. fig. 4.

GONOPLACIDÆ.

Pilumnoplax sulcatifrons (Stimps.), from Yokohama; Targioni-Tozzetti, Crostac. Magenta, pp. 102-106, pl. vii. fig. 2.

Notonyx, g. n.: frontal region as in *Eurycarcinus*, male orifice as in *Ocypode*, other characters like those of *Prionoplax*. *N. nitidus*, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 268, pl. xii. fig. 3, New Caledonia.

Macrophthalmus quadratus, sp. n., *id. l. c.* p. 280, pl. xii. fig. 6, New Caledonia.

GRAPSIDÆ.

Grapsus. Critical notes on the known species and their classification according to the width of the groove for the inner antennæ; Kossmann, Zool. Ergebn. Crust. pp. 59-61, pl. iii. figs. 12 & 13.

Grapsus pietus (Latr.) = *altifrons* (Stimps.), from the Galapagos Islands; Miers, P. Z. S. 1877, p. 73.

Metopograpsus oceanicus (M. E.), from Woosung, China; Targioni-Tozzetti, Crostac. Magenta, pp. 127-130, pl. vii. fig. 4.

Pachygrapsus crassipes (Randall), Yokohama; *id. l. c.* pp. 131-135, pl. viii. fig. 3.

Pachygrapsus minutus, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 293, pl. xiv. fig. 2, New Caledonia.

Discoplax (M.-E., 1867) *longipes*, sp. n., *id. l. c.* p. 295, pl. xv., New Caledonia.

Utica glabra and *barbimana*, spp. nn., *id. l. c.* pp. 296 & 297, pl. xiv. figs. 3 & 4, New Caledonia.

Plagusia dentipes (Haan), Yokohama; Targioni-Tozzetti, l. c. pp. 165-168, pl. xi. fig. 4.

Grapsoides notatus (Heller), from Duke of York Island; Miers, P. Z. S. 1877, p. 136.

Varuna literata (F.), Banka Straits; Targioni-Tozzetti, l. c. pp. 122 & 123.

Nautilograpsus cyaneus (Dana), Atlantic; *id. l. c.* p. 125, pl. viii. fig. 5.

Holometopus hematochir (M. E.), Yokohama; *id. l. c.* pp. 150-154, pl. x. fig. 1.

Sesarma rotundata (Hesse) and *S. (Holometopus) aubrii* (M. E.), both from Duke of York Island; Miers, P. Z. S. 1877, p. 137.

Sesarma teniolata (White, 1847, name only) described; *id. ibid.* footnote, Philippines.

Sesarma chirogona, sp. n., Yokohama, *mederi* (M. E.), Singapore and Woosung, *dussumieri* (M. E.), Singapore, and *dehaani* (M. E.), Woosung; Targioni-Tozzetti, l. c. pp. 136-150, pl. ix. figs. 1-4.

Clistoceloma, g. n.: outer antenna excluded from the orbit; front

notched. Otherwise like *Sesarma*. *C. balansæ*, sp. n., A. Milne-Edwards N. Arch. Mus. ix. [1873] p. 310, pl. xvii. fig. 1, New Caledonia.

Metagrapsus punctatus and *integer*, spp. nn., *id. l. c.* pp. 308 & 309, pl. xvii. figs. 2 & 3, New Caledonia.

Pseudograpsus erythræus, sp. n., Kossmann, *l. c.* p. 60, pl. i. fig. 5, pl. iii. figs. 14 & 15, Red Sea.

Pseudograpsus albus (Stimps.), A. Milne-Edwards, *l. c.* pl. xviii. fig. 2.

Helice tridens (Haan) and *granulata* (Dana), the last from Lake Peteninga, near Rio Janeiro; Targioni-Tozzetti, *l. c.* pp. 155-162, pl. x. figs. 2 & 3.

Helice pilimana, sp. n., A. Milne-Edwards, *l. c.* p. 313, pl. xviii. fig. 1, New Caledonia.

Eriochirus japonicus (Haan), from Japan and Woosung, China; Targioni-Tozzetti, *l. c.* pp. 111-116, pl. viii. fig. 1.

Gnathograpsus barbatus, sp. n., A. Milne-Edwards, *l. c.* p. 316, pl. xvii. fig. 4, New Caledonia.

Heterograpsus elongatus, sp. n., *id. l. c.* p. 317, pl. xvii. fig. 5, New Caledonia.

Heterograpsus affinis (Dana), near Rio de la Plata; Targioni-Tozzetti, *l. c.* pp. 117 & 118, pl. vii. fig. 5, found on the screw of the steamer.

Cyrtograpsus angulatus (Dana), same locality; *id. l. c.* pp. 119-121, pl. viii. fig. 4.

PINNOTERIDÆ.

Halicarcinus planatus (F.), Kerguelen Island, very common; Miers, *l. c.* The same and *H. ovatus* (Stimps.), from Port Jackson; Targioni-Tozzetti, *l. c.* pp. 172-178, pl. x. figs. 4 & 5, pl. xi. figs. 1 & 2.

Hymenosoma læve, sp. n., Targioni-Tozzetti, *l. c.* p. 177, pl. xi. fig. 3, Melbourne.

Myctiris longicarpus (Latr.) and *platycheles* (M. E.), Port Jackson; *id. l. c.* pp. 182-187, pl. xi. figs. 5 & 6.

Elamena pilosa, *minuta*, and *truncata*, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] pp. 322 & 323, the two former pl. xviii. figs. 6 & 7, New Caledonia.

Elamenopsis, g. n.; cephalothorax rather broad, the ischiognathite smaller than the merognathite. *E. lineatus* [-a], *id. l. c.* p. 324, pl. xviii. fig. 4, New Caledonia.

Tubicola longipes, g. & sp. nn., Lockington, P. Cal. Ac. 1876, April, commensal with an Annelid; belongs to *Pinnixa*, Streets & Kingsley, Bull. Ess. Inst. ix. p. 107.

. CALAPPIDÆ.

Matuta. E. Miers reviews the known species, and adds some as follows: *M. victrix* (F.), ♀ = *peroni* (Leach), ♂ = *lesueurii* (Leach), from the Red Sea to Australia, var. n. *crebre-punctata*, Japan, Fiji Islands, and New Hebrides, *rubro-lineata*, sp. n., Indian and Pacific Oceans, Cheefoo, *lineifera*, sp. n., N. W. Australia, *granulosa*, sp. n., Eastern Seas, Torres

Straits, *banksi* (Leach), Indian Seas, China, Philippines, *maculata*, sp. n., Eastern and Chinese Seas, *picta* (Hess) = ? *distinguenda* (Hoffmann, 1874), from Zanzibar to the Australian Seas, *obtusifrons*, sp. n., Fiji Islands and New Hebrides, *lunaris* (Hbst.), Indian Ocean; all figured. Miers, Tr. L. S. (2) i. pp. 241-247, pls. xxxix. & xl.

Matuta victor, var. from Borneo; Targioni-Tozzetti, l. c. pp. 191-193, pl. xi. fig. 7.

Hepatus chilensis (M. E.), from Peru, and *tuberculatus* (Saussure), adult specimens very near *angustatus* (F.); Miers, P. Z. S. 1877, pp. 656 & 657.

LEUCOSIIDÆ.

Actæomorpha, g. n. General aspect of *Actæa*, but buccal cavity triangular; cornea rudimentary; basal joint of the external antennæ apparently fused with the inferior wall of the orbit; flagellum wanting; orbital cavity large, filled with the ocular peduncle. *A. erosa*, sp. n., Miers, J. L. S. xiii. p. 183, pl. xiv., Port Curtis, Australia.

Leucosia fusco-maculata, Suez, *pulcherrima*, Lizard Island, *ornata*, Ceylon, *brunnea*, Singapore, *reticulata*, *perrii*, and *pubescens*, Shark's Bay, W. Australia, spp. nn., Miers, Tr. L. S. (2) i. pp. 236-239, pl. xxxviii. figs. 1-24.

Myra mammillaris (Bell) ?, young specimens; *id.* l. c. p. 239, pl. xxxviii. figs. 25-27, Australia.

Myra subgranulata, sp. n., Kossmann, Zool. Ergebn. p. 65, pl. i. fig. 1, Red Sea.

Ebalia elegans, sp. n., Brito Capello, J. Sci. Lisb. v. [1876] p. 122, Setubal; name (preoccupied) changed to *E. setubalensis*, *id.* l. c. p. 271.

Ebalia orientalis, sp. n., Kossmann, l. c. p. 65, pl. i. fig. 6, pl. iii. fig. 16, Red Sea.

Philyra fuliginosa, sp. n., Java, *scabriuscula* (Leach), *pisum* (Haan), and *carinata* (Bell); Targioni-Tozzetti, Crostac. Magenta, pp. 196-204, pl. xii. figs. 1-4.

Arcania granulosa, sp. n., Miers, Tr. L. S. (2) i. p. 240, pl. xxxviii. fig. 29, Moreton Bay, Australia.

Cryptocnemus holdsworthi, sp. n., *id.* l. c. p. 241, pl. xxxviii. figs. 30-32, Ceylon.

Nursia sinuata, sp. n., Moreton Bay, Australia, and *hardwicki* (Leach) = ? *plicata* (Hbst.), typical specimen figured; *id.* l. c. pp. 240 & 241, pl. xxxviii. fig. 28.

CORYSTIDÆ.

Acanthocyclus gayi (M. E.), from Western Patagonia; Targioni-Tozzetti, l. c. pp. 95-100, pl. vii. fig. 1.

Crossotonotus, g. n.: cephalothorax discoidal, lateral edges lobulated, orbits very large; somewhat resembles *Plagusia*. *C. compressipes*, sp. n., A. Milne-Edwards, N. Arch. Mus. ix. [1873] p. 282, pl. xiii. fig. 1, New Caledonia.

DORIPPIDÆ.

Dorippe granulata (Haan), Yokohama; Targioni-Tozzetti, *l. c.* pp. 238 & 239, pl. xii. fig. 5.

ANOMURA.

DROMIDÆ.

Dromia rumphii (Fabr.) described; Targioni-Tozzetti, *l. c.* pp. 207-209.

HIPPIDÆ.

Hippa talpoidea (Say). S. J. Smith makes some interesting observations on its habits and development. The long feelers are usually hidden by the maxillipeds during life, as in alcoholized specimens. Very nearly fully developed embryos, when removed from the egg, were found to possess all the normal articulated appendages of the fully-formed zoea, but yet without lateral spines. The second zoea-stage, 3 mm. in length, exhibits the rostrum and lateral spines enormously developed; a third zoea-stage, about 4-5 mm. in length, resembles the foregoing in general form and appearance; then follows a last zoea-stage with very large rostrum and more developed abdomen; finally a *Megalopa*-stage, with cephalothorax 3 mm. long and 2 mm. broad, in general form near the full-grown *Hippa*, but with eyes still very large and abdominal segments provided with strong swimming appendages. The author states that Milne-Edwards has mistaken the small first segment of the abdomen for the last thoracic segment, and describes more exactly the mandible and maxillæ. Tr. Conn. Ac. iii. pp. 311-342, pls. xlv.-xlviii.

Remipes pacificus (Dana). Maxillæ and mandible described; *id. l. c.* p. 340, pl. xlvii. figs. 9 & 10. Specimens from the Galapagos; Miers, P. Z. S. 1877, p. 74.

PAGURIDÆ.

On the sexual organs and development, see *antea*, p. 5.

[Bernhardus] *Eupagurus chierighinii* and *tarsipictus*, spp. nn., Nardo, Annot. Crost. p. 94, the first pl. ii. fig. 2, Adriatic Sea.

Pagurus bocagii, *algarbiensis*, *setubalensis*, and *cruentatus*, spp. nn., Brito Capello; J. Sci. Lisb. v. [1876] pp. 123-125, Setubal; some parts, especially an appendicular piece, situated at the root of the third pair of thoracic feet in some of these and in other known species, specially figured. *P. algarbiensis* = *varians* (Costa); *id. l. c.* p. 274.

Clibanarius cayennensis and *carnescens*, Cayenne, *speciosus*, Brazil, and *lordi*, Vancouver Island, spp. nn., Miers, P. Z. S. 1877, p. 657 & 658, pl. lxvi. figs. 1-4. *C. misanthropus* (Risso) = *labillardieri* (Audouin); *id. l. c.* p. 673.

Calcinus elegans (M. E.), Targioni-Tozzetti, Crostac. Magenta, pp. 229-231, pl. xiii. fig. 7.

Cenobita rugosa (M. E.), Java, *id. l. c.* pp. 232 & 233, pl. xiii. fig. 6.

PORCELLANIDÆ.

Porcellana esox (Chierighini, MS.), sp. n., and *longicornis* (Fabr.), described comparatively by Nardo, Annot. Crost. pp. 96 & 97, pl. i. figs. 7 & 8, Adriatic.

Porcellana angulosa (Guérin); Valparaiso, Targioni-Tozzetti, Crostac. Magenta, pp. 212-216, pl. xii. fig. 6, & pl. xiii. fig. 1.

Petrolisthes tuberculatus (Guérin), *violaceus* (Guérin), and a third doubtful species, without name, described; *id. l. c.* pp. 216-222, pl. xiii. figs. 2 & 3.

Rhaphidopus ciliatus (Stimps.), *id. l. c.* pp. 222-224, pl. xiii. fig. 4.

MACRURA.

GALATEIDÆ.

Munida subrugosa (Dana), Western Patagonia; Targioni-Tozzetti, Crostac. Magenta, pp. 234-237, pl. xiii. fig. 5.

SCYLLARIDÆ.

Parribacus [sic] *antarcticus* (Lund), from Duke of York Island, sexual differences, Miers, P. Z. S. 1877, p. 138.

ASTACIDÆ.

Astacus fluviatilis (F.). Anatomical and embryological observations, see *antea*, p. 4.

Notes on the extensive capture of crayfish in the Prussian provinces Brandenburg, Pommerania, and Eastern and Western Prussia, their keeping in confinement, and exportation to France and England, in the German weekly journal "Gartenlaube," 1877, No. 11, also in *Circulare des Deutschen Fischereivereins*, 1877, pp. 123-125.

Cambarus spinosus, sp. n., and *sloanii* (1876), Bundy, P. Ac. Philad. 1877, pp. 171-173, Indiana.

Notes on the spawning (in every month of the year), moulting, and food of the American lobster, and on laws to regulate its capture, by W. W. Wheldon, P. Am. Ass. (Salem) 1875, pp. 133-141.

THALASSINIDÆ.

Gebia venetiarum (Nardo, 1847) ♀ = *littoralis* (Leach), lagoons of Venice; Nardo, Annot. Crost. p. 98, pl. ii. fig. 3.

[*Axius*?] *Bigea tipica* [typ-], new genus indicated, but not precisely characterized, from an old drawing by Chierighini, *id. l. c.* p. 101, pl. i. fig. 4, Adriatic.

Jaxea nocturna (Chierighini, MS., Nardo, 1847) = *Calliaxis adriatica* (Heller, 1856), *id. l. c.* p. 102, pl. ii. fig. 5.

CARIDES.

Crangon schillinus, sp. n. (Chiereghini, MS.), Nardo, l. c. p. 103, pl. ii. fig. 6, Adriatic Sea.

Crangon nigro-maculata, sp. n., Lockington, P. Cal. Ac. 1876, Feb.; is a colour variety of *C. nigricauda* (Stimps.), Streets & Kingsley, Bull. Ess. Inst. ix. p. 108. *C. alaskensis*, sp. n., Lockington, l. c. Alaska.

Cheraphilus boreas (Phipps), varieties of age; Miers, Ann. N. H. (4) xix. p. 135. Sexual differences and Arctic distribution; *id. op. cit.* xx. pp. 57 & 58.

Sabinea septem-carinata (Sabine), sexual differences; *id. l. c.* p. 58.

Vianellia, g. n., founded on an old drawing by Chiereghini, near Crangon, but hands perfectly didactyle. *V. dorsiocollata* [sic], sp. n. (Chiereghini, MS.), Nardo, Annot. Crust. p. 110, pl. iii. fig. 6, Adriatic.

Nika longipes (Nardo, 1847), *id. l. c.* p. 104, pl. iii. fig. 1, Adriatic.

Chiereghinia, g. n., distinguished from *Nika* and *Athanas*, chiefly by the equal didactyle hands and the hairy elongate feet. *C. pellucida* (Chiereghini, MS.), *id. l. c.* pp. 104 & 105, pl. ii. fig. 6, Adriatic.

Hippolyte borealis (Owen), variability of the teeth at the lower edge of the rostrum; Miers, Ann. N. H. (4) xix. p. 134. The same species and *gaimardi* (M. E.), *spinus* (Sow.), *turgida* (Kröyer), *phippsi* (Kröyer)?, *polaris* (Sabine), and *grænlantica* (F. C. Fab.) = *aculeata* (O. Fab., et auctt.), from Smith Sound and Grinnell Land, the last in 82° 30' N. lat., described; *id. op. cit.* xx. pp. 59-63.

Alpheus gambarellus and *gambarelloides* (Chiereghini, MS.), and ? *vitatus*, sp. n., Nardo, l. c. pp. 107-109, pl. iii. figs. 2-4, Adriatic Sea.

Phleusa, g. n., founded on an old drawing by Chiereghini, apparently distinct from *Alpheus* by the third pair of thoracic feet being also didactyle [first pair as in *Alpheus*, but eyes not covered by the shield]. *P. cynea* (Chiereghini, MS.); *id. l. c.* p. 109, pl. iii. fig. 5, Adriatic Sea.

Bellidia, g. n. Internal antennæ very little above the external, composed of two filaments forming a right angle; external antennæ with the basal plates very large. First pair of feet small, didactyle, consimilar; second pair long, very slender, didactyle, both arm and wrist many-jointed. Eyes not covered by the carapace. Abdomen bent abruptly. Tail plates large, all undivided. *B. huntii*, sp. n., Torbay; Gosse, Ann. N. H. (4) xx. pp. 313-316, pl. x.

Palæmon ohionis, sp. n., Smith, Rep. U. S. Fish. Comm. 1872-1873, p. 640, and Forbes, Bull. Illin. Mus. 1876, No. 1, p. 5, Ohio and Mississippi rivers.

Palæmon jelskii, sp. n., Miers, P. Z. S. 1877, p. 661, pl. lxvii. fig. 1, Oyapok, Guiana. *P. nattereri* and *brasiliensis* (Heller), River St. Laurent in Guiana and *P. gaudichaudi* (M. E.) with var. *cementarius* (Pöppig) Peru and Chile; *id. l. c.* pp. 660-662.

Euryr [r] *hynchus*, g. n., near *Palæmon*, having antennulæ with 3 flagella, but rostrum very short and broad; basal scale of the antennæ small; second pair of legs as in *Anchistia*. *E. wrzesniowskii*, sp. n., Cayenne; *id. l. c.* p. 662, pl. lxvii. fig. 2.

STOMAPODA.

Squilla mantis (L.). On its sexual organs, Grobben, SB. Wien Ak. lxxiv. pp. 389-406, with a plate.

Squilla eusebia (Risso), Nardo, Annot. Crust. p. 112, pl. iii. fig. 7, Adriatic.

AMPHIPODA.

Notes on the anatomy of the Amphipods. A. W. Wrzesniewski, Z. wiss. Zool. xviii. pp. 403 & 404 (see above, p. 5).

A. J. BOECK has published the second part of his very valuable monograph of the Scandinavian and Arctic *Amphipoda* (title *anted*, p. 1), at the expense of the Christiania Society of Sciences, assisted by a contribution from His Majesty Charles XV.; this completes the work, which was interrupted by the death of the author in May, 1873. It is edited by his relative Hakon Boeck, from the author's MSS. No new species are described, but a family *Photidae*, p. 546, is established for subfamilies *Leptochirinae*, *Photinae*, and *Microdeutopinae*; *Opis*, Kroyer (1842), *nec* Defrance (1821-24), is renamed *Opisa*, p. 190; and *Lampra*, Boeck (1870), preoccupied in *Lepidoptera* (1816), is renamed *Triteta*, p. 317. The plates contain excellent outlines, with much detail, of too many species for enumeration here.

ORCHESTIIDÆ.

Hyale jelskii, sp. n., Wrzesniewski, meeting of Russian naturalists at Warsaw, Sept. 1876; Z. wiss. Zool. xxviii. p. 104, without description, Cordilleras.

Nicea prevosti (M. Edw., as *Amphithoe*) = *macronyx* (Heller); *N. pontica* (Rathke) imitates the colour of weed on which it lives. Both found at Marseilles; Catta, l. c. p. 6.

GAMMARIDÆ.

Lysianassa, sp. in the Adriatic; Nardo, Annot. Crust. p. 114, pl. iv. fig. 8.

Callisoma branickii, sp. n., Wrzesniewski, meeting of Russian naturalists at Warsaw, Sept. 1876; Z. wiss. Zool. xxviii. p. 404, without description, Nice.

Anonyx nugax (Phipps, as *Cancer*) = *lagena* (Kröyer), Spitzbergen, and critical note concerning *bidenticulatus* (Sp. Bate); Miers, Ann. N. H. (4) xix. p. 136. The former and *gulosus* (Lillj.)?, 83° N. lat., Grinnell Land, described; *id. op. cit.* xx. pp. 96-98, the latter, pl. iii. fig. 2.

Anonyx brocchii, sp. n., Catta, Rev. Montp. iv. [1875] sep. copy, p. 3, Marseilles.

Anonyx kergueleni (Miers, 1875, as *Lysianassa*), Miers, Transit Venus Exp., Crust. p. 8, pl. xi. fig. 4, Kerguelen Island [*anted*, p. 2, note].

Onesimus edwardsi (Kröyer) from Floeberg Beach, 82°, and Discovery Bay, 81° lat. N.; *id.*, Ann. N. H. (4) xx. p. 99, pl. iii. fig. 3.

Ieridium (Grube, 1863, Feb.) = *Perionotus* (Owen, 1863), distinct from *Phlias* (Guérin), *I. rissoanum* = *Phlias rissoanus* (Sp. Bate) = *I. fuscum* (Grube), observed at Marseilles; J. D. Catta, Rev. Montp. iv. [1875, Sept.].

Stegocephalus ampulla (Phipps) and *inflatus* (Kröyer); specimens from Spitzbergen described by Miers, Ann. N. H. (4) xix. pp. 134 & 135.

Peltocoza, g. n., near *Stegocephalus*, two of the coxæ enormously developed, so that the whole animal can conceal itself between them; *P. marioni*, sp. n., Catta, Rev. Montp. iv. [1875, Sept.] (sep. print, p. 2) Marseilles.

Phoxus erythrophthalmus, sp. n., *id. l. c.* p. 3, Marseilles.

Eusirus cuspidatus (Kröyer). Franklin-Pierce Bay, 81° N. lat., with critical remarks; Miers, Ann. N. H. (4) xx. p. 103.

Tritopsis aculeata (Lepechin), Discovery Bay, 81° N. lat., &c.; younger specimens described by Miers, Ann. N. H. (4) xx. pp. 103 & 104.

Amphithonotus bobretzkii, sp. n., Catta, *l. c.* p. 4, Marseilles.

Iphimedia corallina, sp. n., *id. ibid.*, Marseilles.

Acanthozone hystrix (Owen) from Spitzbergen, probably distinct from *cuspidata* (Lepechin) and from *hystrix*, Buchholz; Miers, Ann. N. H. (4) xix. p. 137. The same from Discovery Bay and Franklin-Pierce Bay, 81° & 79° N. lat., with critical remarks; *id. l. c.* p. 100.

Atylus carinatus (Fabr.) from Discovery Bay, 81° N. lat., adult male 28 mm. long; *id. l. c.* p. 100.

Atylus australis (Miers, 1875, as *Paramera*); *id.* Transit Venus Exp., Crust. p. 9, pl. xi. fig. 5, Kerguelen Island [*antea*, p. 2, note].

Gammarus locusta (L.), Floeberg Beach, 82° N. lat., 34 mm. long; *id.*, Ann. N. H. (4) xx. p. 101.

Gammarus berilloni, sp. n., Catta, *l. c.* pl. i., in a ferruginous spring on Mount Mondarain, Basses-Pyrénées, at a height of 750 mètres; *G. rhipidiophorus*, sp. n., in a well at La Ciotat, dep. Bouches du Rhone; eyes small but well developed, sixth pleopod with a bi-articulate branch, as in *G. neglectus* (Sars); telson bifid, both parts united by a thin membrane. The genus *Niphargus* must be united with *Gammarus*, both its species are to be maintained. Catta, N. Denk. schw. Ges. Bex, 1877 (8 pp.)

Niphargus puteanus var. n. *foreli*, living in the lake of Geneva from 30–300 mètres, described and compared with previous descriptions of similar blind *Gammaridae* from deep wells, &c. The author opposes the generic and specific identification with *Crangonyx* and *Gammarus* as proposed by Rougement [see Zool. Rec. xiii. Crust. p. 13], and describes several sensitive organs situated on the back and on the antennæ. A. Humbert, Bull. Soc. Vaud. xiv. [1876] pp. 278–398; abstract in Arch. Sci. Nat. 1877, pp. 58–75, and Ann. N. H. (4) xix. pp. 243–254.

Melita oxyura, sp. n., Catta, Rev. Montp. 1875, sep. print, p. 4, Marseilles.

Protomedea hirsutimanus var. n. *massiliensis*, *id. l. c.* p. 5, Marseilles.

Grubia taurica var. n. *massiliensis*, *id. ibid.*, Marseilles.

Synurella polonica, sp. n., Wrzeniowski, meeting of Russian naturalists at Warsaw, Sept. 1876; Z. wiss. Zool. xxviii. p. 404, without description, Warsaw.

COROPHIDÆ.

Podocerus ornatus (Miers, 1875); Miers, Transit Venus Exp., Crust. p. 11, pl. xi. fig. 6, Kerguelen Island [antea, p. 2, note].

Lusya, g. n., near *Podocerus* and *Cerapus*, not precisely characterized. *L. algensis* (Chiereghini MS.), in the lagoons of Venice, building a tube consisting of fine interlaced filaments on *Zostera marina*. Nardo, Annot. Crostac. p. 115, pl. iv. fig. 7.

CAPRELLIDÆ.

Caprella fabris [-isi] and *cornalia* [-liæ], spp. nn., Nardo, Annot. Crostac. p. 117, pl. iv. figs. 5 & 6, Adriatic.

Caprella septentrionalis (Kröyer) (swimming described) and *C. spinosissima* (Stimps.) (length of spines variable) from Spitzbergen; Miers, Ann. N. H. (4) xix. p. 139. The latter as *Ægina spinosissima* (Stimps.), specimens from Cape Napoleon and Dobbin Bay, 79° N. lat.; *id. op. cit.* xx. p. 104.

ISOPODA.

ARCTURIDÆ.

Arcturus baffini (Sabine) and var. *n. feildeni* (nearly smooth), Floeberg Beach, 82° N. lat.; Miers, Ann. N. H. (4) xx. pp. 63 & 64, pl. iii. fig. 1.

ONISCIDÆ.

Ligia baudiniana (M. E.) ?, from Cayenne; Miers, P. Z. S. 1877, pp. 670 & 671.

Philougria [rectius *Philygria*], Stenhammar, *Diptera*, 1844] *nitida*, sp. n., *id. l. c.* p. 670, pl. lxix. fig. 1, Peru and Guiana.

Porcellio cayennensis, Cayenne, and *hispida* [-us], Mongolia, spp. nn., *id. l. c.* pp. 667 & 676, pl. lxviii. figs. 2 & 5. *P. swammerdami* (Audouin) = *alexandrinus* (Brandt), Egypt; *id. l. c.* p. 676.

Porcellionides, subg. n. of *Porcellio*: posterolateral angles of the first four segments of the body not acute and not produced behind; *id. l. c.* p. 668.

Porcellio (*Porcellionides*) *jelskii*, Peru and Guiana, *flavo-vittata* [-us], Cayenne, spp. nn., *id. l. c.* pp. 668 & 669, pl. lxviii. figs. 3 & 4.

Orthonus, g. n., = *Armadillo*, Brandt, nec Latreille, = *Armadillo*, § 1, Milne-Edwards; posterior margins of all segments straight, lateral margins never straight. *Id. l. c.* p. 664.

Cubaris galapagoensis, p. 74, pl. xii. fig. 2, Galapagos Islands; *C. affinis*, Cayenne, and *gigas*, Nicaragua, p. 666, pl. lxvii. fig. 4, pl. lxviii. fig. 1: *id. l. c.*, spp. nn.

Armadillidium (Brandt) restricted to the species in which the terminal segment is triangular; *id. l. c.* p. 665.

Armadillidium pustulatum (Dum.), from Moldavia; *id. l. c.* p. 675.

Armadillidium cælatum, sp. n., *id. l. c.* p. 665, pl. lxvii. fig. 3, Cayenne.

Armadillo (Latr., pt., nec Brandt, M. E.): distinguished from *Armadillidium* by the terminal segment being quadrate, truncate at the extremity; = *Armadillidium*, § 2, Milne-Edwards. *Armadillo vulgaris* (Latr.), from Cayenne, described. *Id.* l. c. pp. 664 & 665.

Tylos granulatus, sp. n., *id.* l. c. p. 674, pl. lxix. fig. 2, Japan and Borneo. *T. latreillii* (Audouin), from Odessa; *id.* l. c. p. 674.

SPHÆROMIDÆ.

Spharoma produces a distinct sound by sudden flexion and extension of the body; W. Saville-Kent, Nature, xvii. p. 11.

Dynamene eatoni (Miers, 1875); Miers, Transit Venus Exp., Crust. p. 4, pl. xi. fig. 2, Kerguelen Island [*antè*, p. 2, note].

SEROLIDÆ.

Serolis latifrons (White, Miers, 1875) and *septemcarinata* (Miers, 1875), both from Kerguelen Island, described, the latter also figured; Miers, Transit Venus Exp., Crust. pp. 5-7, pl. xi. fig. 3 [*suprà*].

CYMOTHOIDÆ.

Ega semicarinata (Miers, 1875), Miers, Transit Venus Exp., Crust. p. 2, pl. xi. fig. 1, Kerguelen Island [*suprà*].

Nerocila, *Anilocra*, and *Cymothoa*. On the question of their sexuality, see above, p. 5.

Anilocra levis, Martinique and Peru, *trichiura* (White, 1847, name only), Mauritius, spp. nn., Miers, P. Z. S. 1877, pp. 672 & 677, pl. lxviii. fig. 6, pl. lxix. fig. 6.

Livoneca daurica, Onon River, Eastern Siberia, and *laticauda*, Manchuria, spp. nn., *id.* l. c. pp. 676 & 677, pl. lxix. figs. 4 & 5.

Cymothoa æstrum (L.?, Fabr.), from Peru; *id.* l. c. p. 672.

BOPEYRIDÆ.

Gyge hippolytes (Kröyer) and *Phryxus abdominalis* (Kröyer), both on *Hippolyte polaris*, Discovery Bay and Franklin Pierce Bay, 81° and 79° N. lat.: male and female described, and their geographical distribution, Arctic and British, mentioned; Miers, Ann. N. H. (4) xx. pp. 64 & 65.

Athelgue [?] *lorifera* and *intermedia*, spp. nn., on the abdomen of *Pagurus cuanensis* (Thomps.); description of both sexes and the larva of the first species, the second perhaps = *Phryxus longibranchiatus* (Sp. Bate). Hesse, Ann. Sci. Nat. (6) iv. 1876, art. 2, pp. 2-9, pls. i.-viii., British Channel.

Pleurocrypta galatæa-squamosæ (1865), new observations concerning it, and *porcellanæ-longicornis*, sp. n., *id.* l. c. pp. 14-27, pl. ix., British Channel; the genus *Pleurocrypta*, perhaps identical with *Phryxus*, *id.* l. c. p. 46.

General physiological and biological observations concerning this family; *id.* l. c. pp. 27-39.

PHYLLOPODA.

A. GERSTÄCKER, uniting the *Phyllopoda* with the *Cladocera* and *Ostracoda* into one order, *Branchiopoda*, arranges them as follows:—

Subord. 1. *Ostracoda*.

Subord. 2. *Branchiopoda genuina*.

Sect. 1. *B. palliata*.

Subsect. 1. *Diplostraca*.

Tribe 1. *Cladocera*.

Tribe 2. *Holostraca*.

Fam. *Limnetidæ* and *Limnadiidæ*.

Subsect. 2. *Monostraca*.

Tribe 3. *Monostraca*.

Fam. *Apodidæ*.

Sect. 2. *B. gymnota*.

Tribe 4. *Gymnota*.

Fam. *Branchipodidæ*.

Subord. 3. *Branchiura*.

Fam. *Argulina*.

He adds many general observations on the biology, geographical, and palæontological distribution of these animals. Klass. u. Ordn. d. Thierreichs, Arthropodon, pt. 22, pp. 1025–1079.

F. BRAUER has reared several species of *Phyllopoda* from eggs contained in mud sent from foreign localities; for most of them, it seems necessary that the eggs remain for some time in dry mud, otherwise they will not develop. Development will begin when they are again surrounded by water, of which the temperature is somewhat rapidly increased. The author used melting ice very successfully for this purpose, as the eggs can sustain both frost and intense solar heat. By these qualities, the animals are preserved from many enemies, the eggs of which cannot endure exsiccation or such wide differences of temperature, and they will in the course of nature be hatched in spring in sufficient time before desiccation of puddles and ponds. All *Phyllopoda*, however, have not these capabilities; the eggs of *Lepidurus productus*, for example, perish, when dried up. SB. Ak. Wien, lxxv. pp. 583–588.

BRANCHIPODIDÆ.

Branchipus stagnalis (L.) = *lacunæ* (Guérin, Baird, Grube) = *braueri* (Frauenfeld), Upsala; Lilljeborg, N. Act. Upsala (3) ix. a. p. 3.

Branchipus paludosus (O. F. Müll.) = *middendorffianus* (Fischer) = *Branchinecta paludosus* (Verrill), Norway and Lapland; *id. l. c.* p. 4.

Branchipus (*Branchinecta*) *arcticus* (Verrill) in a small freshwater lake and in a stream under ice at Discovery Bay, Grinnell Land, 81° lat. N.; Miers, Ann. N. H. (4) xx. p. 105.

Branchipus abiadi, Tura-el-chadra, on the White Nile, *B. (Chirocephalus) bairdi*, Jerusalem, *carnuntanus*, Parndorfer Heide, Austria, *recticornis*, Tunis, (*Branchinecta*) *ferus*, Jerusalem, (*Streptocephalus*) *vitreus*, Tura-el-chadra, spp. nn., and *proboscideus* (Frauenfeld, Verh. z.-b. Wien, 1873), Chartum, fully described by F. Brauer, SB. Ak. Wien, 1877, pp. 593–607, pls. ii.–vi.

G. W. SCHMANKEWITSCH has again stated that *Artemia muelhauseni*

(Fischer) is a degraded form of *A. salina* (L.), and can be produced by breeding several generations, each in somewhat more concentrated salt water; in the spring of 1876, the saltwater of a lake near Eupatoria having been much diluted by great masses of snow, no true *A. muelhausenii* made its appearance as usually, but only a form intermediate between it and *salina*. Meeting of Russian Naturalists at Warsaw, Sept., 1876, and Z. wiss. Zool. xxviii. p. 402.

APODIDÆ.

Apus cancriformis (Schaff.), Lilljeborg, N. Act. Upsala (3) ix. A. p. 8, Vestrogothia, in Sweden.

Apus dispar, Om-kenena, on the White Nile, 14° N. lat., *sudanicus*, same locality and Chartum, spp. nn. Both sexes in nearly equal number, the male has an additional segment, and the second and third pairs of feet stronger and transformed into grasping organs; in *A. cancriformis*, similar sexual differences can be found, but in a lower degree, and not in all individuals of the same sex. Brauer, SB. Ak. Wien, 1877, pp. 589-593, pl. i.

Apus (subgen. *Lepidurus*) *productus* (Bosc.), Sweden, *glacialis* (Kröyer), Lapland, Nova Zembla, Spitzbergen, Beeren Island, and *macrourus*, sp. n., Archangel, Lilljeborg, l. c. pp. 9-13.

LIMNADIIDÆ.

Limnadia lenticularis (Linn., as *Monoculus*) = *gigas* (Herm.); Lilljeborg, l. c. p. 16. Middle region of Sweden; makes its appearance towards the end of the summer.

Limnadia africana, sp. n., Tura-el-chadra, on the White Nile, males and females in about equal number; Brauer, SB. Ak. Wien, 1877, pp. 608-610, pl. vii. female, pl. viii. male.

Limnetis brachyura (Müll.), Lilljeborg, l. c. p. 18, Archangel, Baltic provinces of Russia and Denmark; has only one pair of maxillæ.

Streptocephalus watsoni, sp. n., Packard, Bull. U. S. Geol. Surv. iii. p. 176, Kansas.

Thamnocephalus, g. n. A frontal inter-antennal shrub-like branched bi-ramous appendage; male claspers curved and simple; abdomen terminating in a spatulate fin-like expansion; egg-sac of the female sub-conical, spreading out at the base. *T. platyurus*, sp. n., *id.* l. c. pp. 174-176, woodcut, Kansas.

Artemia fertilis (Verr.). Fecundated females are viviparous for one occasion, and then produce only eggs with thin shell; non-fecundated females produce eggs with thick shells, destined for hybernation. Males and females in about equal number are found among the descendants of the fecundated females by viviparity, as well as among the young hatched from the eggs with thick shell. V. Siebold, Verh. Ges. Bas. 1876.

Polyartemia forcipata (S. Fischer), Karesuando, in Northern Sweden, also in Lapland and Northern Siberia; Lilljeborg, N. Act. Upsal. (3) ix. A, p. 6.

Lepidurus couesi (Packard, 1875), Montana, 49° N., and *bilobatus*, sp. n., Colorado, Packard, Bull. U. S. Geol. Surv. iii. pp. 177-179, with woodcuts.¹

Estheria californica (Packard) fully described by H. Lenz, Arch. f. Nat. xliii. pp. 24-40, pls. iii. & iv.

CLADOCERA.

A. GERSTÄCKER gives an analytical table of the 31 known genera, arranging them in 6 families:—*Podontidæ* (including *Evadne*), *Polyphe-midæ*, *Leptodoridæ*, *Lynceidæ*, *Daphnidæ*, and *Sididæ*, the three former forming the subtribe *Gymnomera* (Sars), the three latter the subtribe *Calypptomera* (Sars), and adds numerous general remarks on their biology and geographical distribution. Klass. u. Ordn. d. Thierreichs, Arthropoden, pp. 1030-1033, 1038, 1041-1043, 1046, 1050, 1061, 1063-1065.

A. WEISMANN has published an elaborate paper on the formation of winter-eggs in all families, and many genera, of *Cladocera*; the general result is, that in all of them a group of four cells is needed for an egg, three of which yield nourishment to the fourth (generally the third with regard to situation in the germinal stratum), which is transformed directly into an egg; the summer-eggs are nourished by the fluid in which they float; winter-eggs are formed also without fecundation, but without it do not come to perfection and are again dissolved, either in the ovary or later in the ephippium. Z. wiss. Zool. xxviii. pp. 93-254, pls. vii.-xi.

The same author states that with regard to the alternation of sexual and non-sexual generations, the *Daphnoidea* [*Cladocera*] exhibit the following differences:—

(1) Those which live in the midst of great lakes or in the sea, have only one sexual period in the year, before the beginning of frost; the eggs produced by sexual fecundation securing the preservation of the species during winter. *Leptodora*, *Bythotrephes*, *Daphnia hyalina*, *Sida*, *Latona*, *Daphnella brachyura*.

(2) Those which live in ponds have two or three sexual periods in the year, as not only the winter, but also exsiccation in the warmest part of the summer, may interrupt the asexual propagation. *Daphnia pulex*.

(3) Those which live in shallow pools and puddles easily subject to exsiccation, have an indefinite number of sexual periods in the year, males making their appearance as early as the second generation of the year, and both sorts of propagation being found at the same time. *Moina*.

(4) In *Bosmina longirostris* and *Pleuroxus trigonellus*, living in large lakes, no sexual period has hitherto been observed; they are perhaps only propagated asexually.

Polyphemus oculus has only two sexual periods in the first half of the summer; in August no living animals are to be found, but only eggs destined for the next year. Ber. Vers. Naturf. Munich, 1877, p. 178.

SIDIDÆ.

Sida affinis, sp. n., from Southern Germany, distinct from *crystallina* (O. F. Müll.), with which it was confounded by Leydig; Schödler, SB. nat. Fr. 1877, p. 232.

Daphnella brachyura (Lievin), lake of Constance; Weismann, Thierleben des Bodensees, p. 14, pl. i. fig. 2.

DAPHNIIDÆ.

Daphnia gibbosa, *paludicola*, *ventricosa*, and *gracilis*, spp. nn., Heliich, Arch. Landesdurchf. Böhm. iii. sect. 4, pt. 2, pp. 29-35, Bohemia.

Daphnia sarsi, new name for *carinata* (G. O. Sars), *nec* King; Schödler, SB. nat. Fr. 1877, p. 12.

Daphnia rectirostris (Leydig). Specimens living in salt water of the lake Chadschibaisky in Southern Russia do not attain their full development, but resemble the juvenile state of specimens living in fresh water; observations on colour, number of post-abdominal spines, shape and size of antennal bristles, &c. Schmankeuitch, Z. wiss. Zool. xxix. pp. 430-434.

Daphnia carinata (King, 1853) = *macrura* (Dana), *gravis*, sp. n., = *carinata* var. *gravis* (King), *kingi*, sp. n., = *carinata* var. *b.* (King), *cephalata*, sp. n., = *carinata* var. *cephalata* (King), all from Sydney, *neuporti* (Baird), *atkinsoni* (Baird), *similis* (Claus) = *longispina*, Klunzinger, *kisilkumensis*, new name for *vitrea* (Ulanin, 1875, *nec* Kurz), all described or discussed by Schödler, Nat. Daphn. pp. 10-15; also SB. nat. Fr. 1877, pp. 11-13.

Daphnia vitrea (Kurz) = *Hyalodaphnia kahlbergiensis*; Schödler, Nat. Daphn. p. 9.

Simocephalus. 8 known species enumerated; *S. australiensis* (Dana) and *paradoxus*, sp. n., = *Daphnia elizabethæ* var. *acutirostrata* (King, 1853), from Australia, *ægypticus* (Fischer, as *Daphnia*), and *nasutus* (Jurine), described, *Daphnia elizabethæ*, King, from Sydney, = *vetulus* (Müll.); Schödler, Nat. Daphn. pp. 16-18, also SB. nat. Fr. 1877, p. 13.

Ceriodaphnia (Dana). 13 known species enumerated; *C. reticulata* (Jurine), *megops* (Sars), *leydigi*, and *nitida*, spp. nn., Germany, both confounded by Leydig with *quadrangula* (Müll.), described; *id.* Nat. Daphn. pp. 20-22.

Ceriodaphnia honorata (King, as *Daphnia*), Australia; *id.* SB. nat. Fr. 1877, p. 14.

Scapholeberis (Schödl.). The five known species enumerated, differences between *mucronata* (Müll.) and *cornuta* (De Geer, Schödl.) pointed out; *id.* Nat. Daphn. pp. 23 & 24.

Moina (Baird). Generic characters and known species reviewed; *M. lilljeborgi*, sp. n., = *brachiata*, Lilljeborg, *nec* Jurine, Sweden and Northern Germany, *micrura* (Kurz), Bohemia, and *macleayi* (King), Australia, described; *id.* l. c. pp. 3-9, also SB. nat. Fr. 1877, p. 14. The known species discussed, and *paradoxa*, sp. n., remarkable by the

half-moon shaped spermatozooids, described; Gruber & Weismann, Verh. nat. Ges. Freib. vii. pp. 50-116.

Moina fischeri, new name for *Daphnia rectirostris* (Fischer, nec O. F. Müll.), Hellich, Arch. Land. Böhm. iii. sect. 4, pt. 2, p. 55, with woodcut, Bohemia.

Pasithea rectirostris (O. F. Müll.). Male described by Gruber & Weismann, Verh. nat. Ges. Freib. vii. p. 50.

Lathonura lemne (King, 1853, as *Moina*), Australia; Schödler, SB. nat. Fr. 1877, p. 14.

Macrothrix laticornis, Claus, Denk. Ak. Wien, xxxvii. p. 150, pl. vii. fig. 24, female; Weismann & Gruber, Verh. nat. Ges. Freib. vii. p. 50.

Bosmina longirostris (Müll.), head and cervical organ figured by Claus, l. c. p. 151, pl. iv. fig. 9.

Bosmina longispina (Leydig) in the Lake of Constance; A. Weismann, Thierleben des Bodensees, p. 14, pl. i. fig. 5.

Bosmina brevicornis and *bohémica*, spp. nn., Hellich, Arch. Land. Böhm. iii. sect. 4, pt. 2, pp. 60 & 61, the former with woodcut, Bohemia.

LYNCEIDÆ.

Chydorus punctatus, sp. n., Hellich, Arch. Land. Böhm. iii. sect. 4, pt. 2, p. 110, with woodcut, Bohemia.

POLYPHEMIDÆ.

C. CLAUD reviews the whole organization of this family, in comparison with that of *Leptodora* and the *Daphniidæ*: the shell is transformed into a uterus-like sac, the abdomen is reduced, only three segments being present in *Bythotrephes*, and no visible segmentation of it in *Polyphemus*; the number of feet is reduced to four pairs, and all are prehensile; the male is distinguished in all genera by a hook at the terminal joint of the first pair. The ventral string of the nervous system, the enormous eye, the intestinal tract, and the considerable corpus adiposum, the shell-gland, the shape of which is different in *Podon*, *Evadne*, and *Polyphemus*, and the function of which is perhaps that of a kidney, the so-called sucker on the neck, which really is a gland, the organs of circulation and respiration, and finally the generative organs, remarkable by the smallness of the ovary, the large uterus with thick walls, the peculiar nutritive colls in the egg, and the sexual differences, are comparatively described and discussed. Denk. Ak. Wien, xxxvii. pp. 137-160, with 7 plates.

A. WEISMANN opposes the opinion of Claus, that in *Evadne* and *Podon* the walls of the breeding sac yield nourishment to the eggs; Z. wiss. Zool. xxx. pp. 194-202.

Polyphemus oculus (Müll. ??, Leydig), probably distinct from the more common *pediculus* (De Geer); Schoedler, SB. nat. Fr. 1877, pp. 232 & 233. Female figured by Claus, l. c. pl. iii. fig. 7.

Bythotrephes longimanus (Leydig), from Lake Constance, and *cederstroemi* (Lillj.), from Sweden, specifically distinct by the form of the caudal spine; Schoedler, l. c. pp. 233 & 234. Observed in Lake Con-

stance, by night near the surface, at day in deep water; A. Weismann, Thierleben des Bodensees, pp. 12-14, pl. i. fig. 1. Female figured by Claus, *l. c.* pl. i. fig. 1, pl. ii. fig. 6.

Evadne tergestina, sp. n., Claus, *l. c.* p. 140, pl. v. fig. 15 female, fig. 16 male, Trieste. *E. spinifera*, id. *l. c.* pl. vi. fig. 21.

Podon intermedius (Lillj.), female; id. *l. c.* p. 138, pl. xxiii. fig. 23, Trieste.

Leptodora hyalina (Lillj.), in Lake Constance, near the surface, with notice of its habits; Weismann, pp. 15-17, pl. i. fig. 4.

OSTRACODA.

A. GERSTÄCKER gives an analytical table of the 26 known genera, arranging them in six families, *Cyprididae*, *Cytheridae*, *Halocypridae*, *Cypridinidae*, *Polycopidae*, and *Cytherellidae*, and adds general remarks on their biology, geographical and palæontological distribution; Klass. u. Ordn. d. Thierreichs, Arthropoden, pt. 22, pp. 1025-1028, 1037, 1053, 1063, 1070-1079.

COPEPODA.

BRANCHIURA.

ARGULIDÆ.

Analytical table of the 5 known genera and list of the known species of *Argulus*, 15, and *Gyropeltis*, 4, with indication of the fishes on which they live, by A. GERSTÄCKER, *l. c.* pp. 1034 & 1058.

NATANTIA.

Embryological observations on *Cyclops*, *Diaptomus*, *Temora*, and *Candacia*, by HOEK [*anted*, p. 7].

W. SCHMANKEWITSCH has published, 1875 (in Russian), some very important observations on several Copepods living in fresh and salt water, and their degeneration by being bred in more concentrated salt water [*anted*, p. 6]. The new species will be mentioned below.

CYCLOPIDÆ.

Cyclops odessanus, sp. n., and critical notes concerning *C. brevicornis* and *brevicaudatus* (Claus); Schmankewitsch, in the publications of the New Russian Society of Naturalists, iii. 2, 1875, pp. 32-36, 74-77. *C. brevicaudatus* (Claus): its degenerate saltwater form; id. Z. wiss. Zool. xxix. p. 439.

Cyclops leeuwenhæki, sp. n., Hoek, Tijdschr. Ned. Dierk. Ver. iii. [1876], Holland.

Heterocope robusta (Sars), Lake Constance; Weismann, Thierleben des Bodensees, p. 14, pl. i. fig. 3.

1877. [VOL. XIV.]

HARPACTIDÆ.

Cletocamptus, g. n.; type, *Cyclops stræmi* (Baird). *C. retrogressus*, sp. n., Schmankewitsch, in the publications of the New Russian Society of Naturalists, iii. pt. 2, 1875, Southern Russia.

Transfuga, g. n., and *T. salinus* and *lacustris*, spp. nn., *id. ibid.*

CALANIDÆ.

Temora clausi, sp. n., Hoek, Tijdschr. Ned. Dierk. Ver. iii. [1876], Holland.

PARASITICA.

R. KOSSMANN defends his classification of this suborder [see Zool. Rec. xii. p. 218] against the objection made by Prof. Claus; Zool. Ergebn. Crust. pp. 4-10.

LICHOMOLGIDÆ.

Lichomolgus sepicola (Claus): male and females in three different ages found on *Sepia officinalis* at Trieste, and described by Wierzejski, Z. wiss. Zool. xxix. pp. 574-580, pl. xxxiv.

Lichomolgus forficula (Thorell) = *elongatus* (Buchholz) and *L. furcillatus* (Thorell), var. n. *mediterranea*; Kossmann, Zool. Ergebn. Crust. pp. 18 & 19, pl. iv. figs. 2 & 1, Mediterranean.

Lichomolgidium, g. n. [no generic character given], for *L. sardum*, sp. n., *id. l. c.* p. 19, pl. iv. fig. 3, Mediterranean, on *Cynthia microcosmus*.

Lecanurius, g. n. [no generic character given], for *L. intestinalis*, sp. n., within the intestine of *Muelleria lecanora* (Jäger), Philippines; *id. l. c.* pp. 20-22, pl. v. fig. 1.

Sabelliphilus sarsi (Clap.): specimens from Spezzia described, and *S. leuckarti*, sp. n., on a species of *Sabella*, Red Sea; *id. l. c.* pp. 16 & 17, pl. iii. fig. 2, pl. ii. figs. 2 & 3, male and female.

Stellicola, g. n.; perhaps = *Asterocheres* (Böck), but first antennæ 7-articulate, oral parts as in *Lichomolgus*. *S. thorelli*, on *Ophidiaster multiforis* (M. Tr.), *oreastriphilus* [!], on *Asteropsis carinifera* (M. Tr.), both Red Sea, and *semperi*, on *Ophidiaster miliaris*, *alabatensis*, host unknown, and *pleurobranchi*, on a species of *Pleurobranchus*, Philippines, spp. nn., *id. l. c.* pp. 11-16, pl. i. figs. 1-3, pl. ii. fig. 1, pl. iii. figs. 1 & 3.

Boholia, g. n. [no generic character given], for *B. cerianthiphila*, sp. n., on mesenterial bands of *Cerianthus*, Bohol, Philippines; *id. l. c.* p. 22, pl. iv. fig. 4, pl. v. fig. 2.

ERGASILIDÆ.

Ergasilus mugilis, sp. n., Vogt, Mém. Inst. Génév. xiii.

Paclabius, g. n. [no diagnosis given], for *P. tumidus*, sp. n., in the pericardium of *Tridacna*, Philippines; Kossmann, Zool. Ergebn. Crust. pp. 23 & 24, pl. vi. figs. 1-10.

BOMOLOCHIDÆ.

Eunicicola, g. n.; intermediate between the *Bomolochidæ* and *Nereidicolidæ*. No eyes; outer maxillipeds in the male very large and hook-shaped, in the female bell-shaped, scaly; female provided with a sucker. *E. clausi*, sp. n. Kurz, SB. Ak. Wien, lxxv. pp. 21-28, pls. i. & ii.

CALIGIDÆ.

Chalimus = *Caligus*, juv.; Hesse, Ann. Sci. Nat. (6) v. No. 10, 3 pp. [Already stated, in 1852, by F. Müller, Arch. f. Nat. xviii.]

Stasiotes, g. n.; near *Pandarus*. Beak long, narrow. Palps articulated, foliaceous. Anterior antennæ 2-jointed, springing from the under surface of the frontal laminae; posterior antennæ stout, 4-jointed. A scale-like body, thickly set with stout, stiff hairs at the base of the chelæ. Four pairs of abdominal feet 2-branched; in the first three pairs, each of these branches 2-jointed, each of the joints provided with bristles, which are lined with fine hairs. *S. rhinodontis*, sp. n., South Africa, on *Rhinodon typicus* (A. Smith). E. P. Wright, P. R. Irish Ac. (2) ii. pp. 583 & 584, pl. xxxv.

DICHELESTIIDÆ.

Lernanthropus gisleri (Bened.), male, female, and Nauplius-like stage described by Hesse, Rev. Montp. vi. [1876], pp. 252-260, pl. iv.

ANTHEACHERIDÆ.

Philichthys. A paper by C. Vogt, Recherches cotières i. Genève, 1877, (Mém. Inst. Genève. xiii.) has not reached the Recorder.

Philichthys lichia, *denticis*, *pagri*, *pagelli*, and *baraldi*, spp. nn., Mediterranean, on *Lichia amia*, *Dentex vulgaris*, *Pagrus vulgaris*, *Pagellus myrus*, and *Chrysophrys aurata*, Richiardi, Atti Soc. Tosc. iii. (separate print, pp. 1-9), pl. vi. figs. 1-5. *P. sieboldi*, *minimus*, *grubii*, *agassizi*, *heckeli*, and *murena*, spp. nn., on *Box boops*, *Serranus hepatus*, *Sargus annularis*, *Charax puntazza*, *Brama raii*, and *Murena helena*, id. l. c. pp. 1-11, pl. x.

Philichthys edwardsi and *steenstrupi*, spp. nn., id. op. cit. ii. fasc. 2 (separate print, pp. 9-12), pl. vi. figs. 4 & 5, Mediterranean, the first in the frontal holes of *Serranus cabrilla*, the latter in those of *Mullus barbatus* and *surmuletus*.

Poly[r]hynchus, g. n., proposed by Richiardi, following the authority of C. Vogt, for *Philichthys sciencæ* (Rich.), on account of the aberrant form of the female; l. c. p. 12.

Colobomatus (Hesse). Critical note on this genus, which is near *Philichthys*, Hesse having misunderstood the fore part as the hinder, and the upper side as the under; id. l. c. p. 13.

Leposiphilus labri (Hesse), parasite of *Labrus donovani* (Vul.), male very rare, provided with two cephalic, two thoracic, and eight abdominal

segments; genital opening in the second thoracic segment. Vogt, Mém. Inst. Genève. xiii. Notes on the same by Richiardi, *l. c.* p. 14.

Sphaerifer (*Sphaerosoma*, Leidig) *leydigi*, sp. n., Richiardi, Atti Soc. Tosc. iii. pp. 10-13, pl. vi. figs. 6-8, Mediterranean, in the frontal sinus of *Umbrina cirrosa*, with its Nauplius-stage described.

CHONDRACANTHIDÆ.

Chondracanthus cornutus (Müll.), *zei* (Guér.), and *gibbosus* (Kröy.) discussed, the first resembling the younger stages of the two latter; eye present in the male, wanting in the female; a distinct vent; intestine of *C. zeï* provided with branched cœca which extend into the cutaneous appendages. They do not feed upon the blood but on the slime of fishes, and the fixation on the gills serves chiefly for securing a constantly renewed current of water to the eggs of the parasite. Certain resemblances between *Chondracanthus* and the *Ergasilidæ* are pointed out. Vogt, Mém. Inst. Genève. xiii.

LERNÆIDÆ.

Pennella balenoptera, sp. n., Koren & Danielssen, Fauna Littoralis Norvegiæ, pt. iii. pp. 157-163, pl. xvi. figs. 1-9, attached to a *Balenoptera rostrata* (Fabr.) = *Pterobalæna minor* (Eschr.), on the coast of Norway, associated with *Conchoderma virgatum* (Spengler).

The larva and female of a *Lernæid*, probably *Pennella varians* (Steenstr. & Lütke.), found on the gills of *Sepia*, *Eledone*, and *Loligo*, at Trieste, described by A. Wierzejski, Z. wiss. Zool. xxix. pp. 562-574, pls. xxxii. & xxxiii.

Lernæenicus (Lesueur, 1824) = *Lernæonema* (M. E., 1840), all species enumerated, *L. vorax* on *Umbrina cirrosa*, and *L. neglectus*, spp. nn., on various species of *Mugil*, Mediterranean; Richiardi, Atti Soc. Tosc. iii. (separate print, pp. 1-13), pl. vii. figs. 1-43.

Peroderma (Heller, 1865) = *Taphrobia* (Cornalia). Generic characters thus amended: "Corpus elongatum, versus partem anteriorem processu laterali instructum, collum efformans, ad apicem caput globosum tubulis ramosis copiose præditum, infra cum ore rostriformi et pedibus abdominalibus. Pedes abdominales primi et secundi paris bene evoluti, biremes, tertii paris uniremes, remis biarticulatis ciliatis. Fila ovigera longissima attenuata." Male unknown. *P. cylindricum* (Heller) = *T. pilchardi* (Cornalia) on sardines, *Clupea pilchardus*, in the Mediterranean. Richiardi, Atti Soc. Tosc. ii. fasc. 2 (separate print, pp. 1-7), pl. vi. figs. 1-3.

LERNÆOPODIDÆ.

General notes on the knowledge of this family, and comparative description of their limbs, viz., two pairs of antennæ, one pair of mandibles, one

of maxillæ and two pairs of maxillipeds; abdominal feet generally wanting, in *Anchorella emarginata*, female, rudimentary. Kurz, Z. wiss. Zool. xxix. pp. 380-384 & 415-426.

Lernæopoda arcturi, sp. n., on the gills of *Salmo arcturus* (Gthr.), at Floeberg Beach, Grinnell Land, 82° lat. N.; Miers, Ann. N. H. (4) xx. p. 106, pl. iv. fig. 2.

Achtheres selachiorum, sp. n., Kurz, Z. wiss. Zool. xxix. pp. 385-389, pl. xxv. fig. 1, & pl. xxvii. figs. 38-49, on the male orifice of *Mustelus levis* and *Myliobatis aquila*, abdomen distinctly articulated, Trieste.

Brachiella malleus (Rud.). Nauplius-stage and the very small dwarf-like male described; Vogt, Mém. Inst. Genève. xiii.

Brachiella pastinacæ (Baird), female, found at the spiracle of *Myliobatis aquila*; Kurz, Z. wiss. Zool. xxix. pp. 389 & 390, pl. xxv. figs. 2 & 3, pl. xxvi. fig. 36, & pl. xxvii. fig. 45.

Anchorella uncinata (Müll.), the pigmy male described by Vogt, Mém. Inst. Genève. xiii.

Anchorella sargi and *scombræ*, spp. nn., on the gills of *Sargus annularis* (L.), and *Scomber scombrus*, *A. hostilis* (Heller) gills of *Umbrina cirrosa*, *A. fallax* (Heller) on *Dentex vulgaris*, *A. emarginata* (Kröy.) on *Alosa vulgaris*, *A. trigla* (Claus), gills of *Trigla lineata*, Trieste, all described by Kurz, Z. wiss. Zool. xxix. pp. 391-407, pl. xxv. figs. 4-15, pl. xxvi. figs. 22-32, pl. xxvii. figs. 41, 43, 44, 46-48, & 50-52.

Cestopoda, g. n. A long cephalothorax, shorter abdominal and small post-abdominal part quite distinct in the female. First pair of maxillipeds forming a muscular band by which the animal fixes itself on a thread of the gills of a fish. Ovisacs supported by the muscular band-like abdominal feet, and united by a membrane. *C. amplexens*, sp. n., on the gills of *Sargus annularis* (L.), Trieste, and *C. lize* (Kröyer, as *Anchorella*) on *Mugil liza*, New Orleans; Kurz, Z. wiss. Zool. xxix. pp. 407-415, the former pl. xxvi. figs. 16-21 & 34, pl. xxvii. fig. 49.

Tracheliastes polycolpus (Nordm.) var. n. *phoxini*, female found on *Phoxinus levis* (Ag.), and its different stages of age described; in the adult nervous system, eyes and heart disappear wholly; the young are hatched in the form of a *Cyclops*. Vejdewsky, Z. wiss. Zool. xxix. pp. 15-46, pls. ii.-iv.

CIRRIPIEDIA.

Embryological descriptions by P. P. C. Hoek [*ante*, p. 7].

Balanus improvisus (Darwin) was very numerous in 1874 in the Baltic, at Eldena, near Greifswalde; Friedel, Nachr. mal. Ges. 1877, p. 184.

Balanus porcatus (Ducosta), Cape Napoleon, Smith Sound, 79° lat. N., from depths of 13-70 fathoms, 28 mm. high, 29 in diameter; Miers, Ann. N. H. (4) xx. p. 107.

XIPHOSURA.

GERSTÄCKER, in the above quoted manual, pp. 1081-1088, commences his treatment of the *Limulida*, which forms in his arrangement the fourth order of *Crustacea*, named *Pecilopoda*.

ARANEIFORMIA.

[See PYCNOGONIDEA, in the *Arachnida*, *infra*.]

ARACHNIDA.

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S.

LIST OF PUBLICATIONS.

AUSSERER, ANTON. Analytische Uebersicht der Europäischen Spinnen-Familien. Mitth. Ver. Steierm. 1877, pp. 98-114, 2 pls.

Contains a list of the European families and genera of Spiders, with a table for the determination of families and sub-families. Those parts of spiders considered to be of systematic value are described, and illustrated in the two plates.

P. BERTKAU, SB. niederrhein. Ges., 1877, pp. 28-30, makes some remarks on the generative organs and spermatozoa of Spiders, referring on the same subject to a work by himself in Arch. f. Nat. xli. p. 235. The results of his observations are summed up as follows:—The organs by which the seminal fluid is conveyed to the female spider consist of a “variously formed adjunct to the last joint of the palpus,” made up of two parts, a coiled tube for the reception of the fluid, and a hollow body within which the tube is coiled. The spermatozoa of many (perhaps of all) spiders show energetic movements when freshly taken from the secreting vessels. These movements cease after a time, as they become coagulated into larger or smaller masses by some adhesive substance, which, after a longer or shorter interval, dissolves and the spermatozoa are set free. This is looked upon as an important provision for the preservation of the vital power of the seminal fluid, which after having been emitted, and imbibed by the palpal organs from the secreting vessels, may possibly (and probably often does) remain in them for some time before it is placed in the female receptacle.

— Ueber fünf bei Bingen gefundene Weibchen einer Eresus-art, wahrscheinlich *E. cinnaberinus*, Oliv., und die systematische Stellung der Eresiden. Verh. Ver. Rheinl. (5) iv. pp. 267-282.

Details the discovery, near Bingen, of some black females of *Eresus* which the author supposes, with good reason, to be the hitherto unknown

females of *E. cinnaberinus*, Oliv., although differing remarkably in colour. The views of various Araneologists on the systematic position of *Eresus* are discussed; and the conclusion is come to, that it forms a separate family most nearly allied to *Amaurobius*.

BLACKWALL, JOHN. A List of Spiders captured in the Seychelle Islands by Professor E. Percival Wright, M.D., F.L.S., with descriptions of species supposed to be new to Arachnologists. Notes and Preface by the Rev. O. P. Cambridge, M.A., C.M.Z.S. P. R. Irish Ac. (2) iii. (sep. copy) pp. 1-22, pls. i. & ii.

Describes and records 23 species of various families and genera; 16 species being considered new to science. Blackwall's MS. (written several years before publication) was submitted to the Recorder for revision; this is carried out, wherever considered necessary, by notes (within brackets), added to the original descriptions, which are thus untouched.

BADLEY, H. H. B. *Araneides* of the Chevert Expedition. Part ii. P. Linn. Soc. N. S. W. ii. pp. 115-120.

Eleven species, belonging to several families, are recorded, 4 species and 1 genus (of the family *Scytodidae*) being described as new.

BRADY, GEORGE STEWARDSON. Notes on Freshwater Mites. P. Z. S. 1877, pp. 24-27, pls. iii. & iv.

Describes 5 species of two families, 4 species as well as 1 genus being new.

BUTLER, A. G. Account of the Zoological Collection made during the visit of H.M.S. 'Peterel' to the Galapagos Islands. *Arachnida* and *Myriopoda*. P. Z. S. 1877, pp. 75-77, pl. xiii.

Records and describes 1 species of *Scorpionidae*, and 6 of *Araneidea*; 4 of the latter, belonging to three families, being new to science.

CAMBRIDGE, O. P. On the Spiders of Scotland. Ent. x. pp. 154-159, 174-181.

Contains a review of all the work hitherto done in respect to Scotch Araneology, with a list of species; the localities are added, with the names of the collectors of each species. 9 families are represented, *Dysderidae*, *Drassidae*, *Dictynidae*, *Agelenidae*, *Theridiidae*, *Epeiridae*, *Thomisidae*, *Lycosidae*, *Salticidae*, comprising 53 genera, and numbering 213 species, of which however 102 are contained in 3 genera of *Theridiidae*, viz., *Neriene* 37, *Walckenaera* 28, and *Linyphia* 37.

—, On some Spiders collected by the Rev. George Brown in Duke of York Island, New Britain, and New Ireland. P. Z. S. 1877, pp. 283-287.

Records 4 species belonging to the families *Epeiridae*, *Gasteracanthidae*, and *Thomisidae*, 2 of the species being described as new to science.

—, On some new species of *Araneidea*, with characters of two new genera, and some remarks on the families *Podophthalmides* and *Dinopides*. Tom. cit. pp. 557-578, pls. lvi. & lvii.

Describes 12 spp. nn., belonging to 6 families of *Araneidea*, *Gasteracanthidae*, *Cryptothelidae*, *Eripidae*, *Podophthalmidae*, *Dinopidae*, and *Salti-*

cule; and characterizes 2 new genera, belonging to the last two of the above families.

(CAMBRIDGE, O. P.) On some new genera and species of *Araneidea*. Ann. N. H. (4) xx. pp. 26-39, pls. vi. & vii.

Describes and characterizes 2 new genera of *Theraphosidae*, from Australia, *Atrax* and *Aganippe*, the former containing 1 the latter 2 new species; and 1 new genus of *Arctidae*, containing 1 species, from Madagascar. 7 other new species of the families *Theraphosidae*, *Phoroncididae*, and *Gasteracanthidae*, from South America, Swan River, Cape York, Madagascar, and Ceylon, are described and figured.

—. On some new and little known Spiders from the Arctic Regions. Tom. cit. pp. 273-285, pl. viii.

Includes some spiders (13 species of *Dictynidae*, *Agelenidae*, *Theridiidae*, and *Lycosidae*) found in Spitzbergen by the Rev. A. E. Eaton; in North Greenland by Mr. E. Whympere; and by Captain Feilden and Mr. Hart during the late Arctic expedition. 7 of the species are described as new, 5 of them being also figured.

EMERTON, J. H. A Comparison of the Spiders of Europe and North America. P. Bost. Soc. xix. pp. 68-72.

States that the greater part of the known spiders of North America (about 300) belong to the same genera as those of Northern Europe, and about one-fourth "to the same or similar species"; the greater part of these belong to the smaller European genera (as *Ocyale*, *Tibellus*, *Eucharia*, and *Hyptiotes*), while the genera largely represented in both countries (as *Lycosa*, *Xysticus*, *Clubiona*, *Dictyna*, and *Erigone*) have fewer species common to both. Several house-spiders, common to both countries, have probably been imported from one into the other, while many of the most common species (as *Epeira diademata*, Clk., of Europe, and *Agelena navia*, Hentz, of North America) keep rigidly to their own limits. The respective Faunæ are conspicuously different, in the number of southern spiders coming north in America; while those southern forms which come north in Europe are few.

—. Descriptions of two new Spiders from Colorado. Bull. U. S. Geol. Surv. iii. pp. 528 & 529, with woodcuts.

Describes 2 spp. nn. of the families *Drassidae* and *Epeiridae*.

HASELTI, A. W. M. VAN. Araneæ Exoticæ, quas quondam in Indiâ Orientali (præsertim insulâ Amboinâ) collegit Cel. Dr. C. L. Dole-schall. Tijdschr. Ent. xx. pp. 51-56.

Enumerates 46 species, and figures *Epeira caput-lupi*, Dol. (pl. iv. fig. a), and a spider's nest with very long petiole (fig. b).

KEYSERLING, (GRAF) EUGEN. Ueber amerikanische Spinnenarten der Unterordnung *Citigrade*. Verh. z.-b. Wien, xxvi. [for 1876, pub. in 1877] pp. 609-708, pls. vii. & viii.

Divides the suborder *Citigrade* into three families, *Lycosoidæ*, *Oryopoidæ*, and *Ctenoidæ*, and gives an analytical table of genera of the first and last. One new genus and 34 new species of *Lycosoidæ*, 3 new genera

and 11 new species of *Ctenidae*, and 4 new species of *Oxyopidae*, are characterized and described, portions of structure being also figured.

KOCH, LUDWIG. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg: 1877, pts. 20 & 21, pls. lxxvii.-lxxxiv.

The continuation of the work [*cf.* Zool. Rec. xiii. *Arachn.* p. 3]. 39 species, of which 35 are new to science, are described and figured.

LEBERT, HERMANN. Die Spinnen der Schweiz, ihr Bau, ihr Leben, ihre systematische Uebersicht. N. Denk. schw. Ges. xxvii. pp. 1-321, pls. i.-vi.

An important work. Pt. 1 (pp. 1-27) treats fully upon the structure of spiders; pt. 2 (pp. 27-58) on their life, habits, and economy; pt. 3 (pp. 58-88) on the geographical distribution of those indigenous to Switzerland. The remainder of the work is occupied by descriptions of species. The number of known Swiss spiders is 435: *Orbitelariæ* 54, *Retitelariæ* 92, *Tubitelariæ* 126, *Territelariæ* 1, *Thomisidæ* 54, *Lycosidæ* 53, *Attidæ* 55. These are divided among 7 families and 77 genera. The genera most numerous represented are *Epeira*, 30 species, *Linyphia* 24, *Theridium* (including *Phyllonethis*, *Nesticus*, *Asagena*, *Steatoda*, and *Lithyphantes*) 21, *Erigone* 20, *Tegenaria* 13, *Drassus* (and *Drassodes*) 18, *Pythionissa* 9, *Amaurobius* 8, *Clubiona* 19, *Thomisus* (including *Thomisus*, *Diaa*, *Xysticus*, *Misumena*, and *Oxyptila*) 34, *Philodromus* 12, *Lycosa* (including *Aulonia*, *Tarentula*, *Trochosa*, and *Lycosa*) 43, *Heliophanus* 12, *Attus* 14. 16 species are described as new, and belong to the *Epeiridæ*, *Theridiidæ*, *Agelenidæ*, *Drassidæ*, *Lycosidæ*, and *Salticidæ*. The plates contain some excellent, and highly-magnified, details of structure, especially of the male palpi of some of the species; the various parts of the male palpal organs, and female genital aperture, are also figured in detail. A list is added (pp. 314 & 315) of 25 species of Swiss *Opiliones* (*Phalangidea*) and 8 species of *Chernetidæ* (*Pseudo-scorpiones*).

MENGE, A. Preussische Spinnen. ix. Fortsetzung. Schr. Ges. Danz. (n. f.) iii. pp. 455-494, pls. lxxvi.-lxxxi. [*cf.* Zool. Rec. xiii. *Arachn.* p. 3].

Continues the work, and contains the genus *Diaa*, Thor., fam. *Thomisidæ* (1 sp.), and a portion of the fam. *Salticidæ* (21 spp.). 3 new genera of the latter are characterized, and 4 new species described.

MURRAY, ANDREW. Economic Entomology. One of the South Kensington Museum Science Handbooks. London: 1877, pp. 1-374, with numerous woodcuts.

Includes under the head of "*Aptera*" all the Arachnidous orders, together with the Woodlice, Myriapods, Lice, and Springtails. [It is not easy to see the advantage of thus recurring to an old and exploded classification, even for the sake of practical convenience.] The scorpions and their allies (*Cheliferæ*, *Phrynus*, *Thelyphonus*, and *Galeodes*) are shortly noticed (pp. 34-43); their known or reputed venomous qualities being the chief points noted. The *Araneidea* occupy pp. 43-92, and are considered almost wholly beneficial to man. The reputed venom of *Latrodectus malmignatus* and *Lycosa tarentula* is discussed (pp. 65-68).

The remainder of this part of the work is occupied by a short sketch of the families and genera of British spiders, following the arrangement proposed by the Recorder, Tr. L. S. 1874. The greater portion of the volume (pp. 93-374) is taken up by the *Acarina* [*Acaridea*] or Mites, these being, for the most part, injurious to man. As a first attempt to bring together what is at present known upon this large, most interesting, but too much neglected, order, this part of the work is very valuable. The *Acarina* are divided into eight families, two of them being again divided into subfamilies.

PLATEAU, FÉLIX. Note sur les phénomènes de la digestion, et sur la structure de l'appareil digestif, chez les *Phalangides*. Bull. Ac. Belg. (2) xlii. [1876], pp. 719-754, plate, figs. 1-29.

Describes and figures the anatomical (internal) structure of *Phalangium parietinum*, De Geer, *Opilio hystrix*, Latr., and *Liobunus rotundus*, Latr., under the following heads:—"L'intestin buccal," "l'intestin moyen," and "l'intestin terminal." The works, in the same field, of Treviranus, Tulk, Blanchard, Ramdohr, and others, are noticed, and compared with the author's conclusions.

— Recherches sur la structure de l'appareil digestif, et sur les phénomènes de la digestion chez les Aranéides dipneumones. *Op. cit.* xlv. pp. 129-181, 323-355, 477-531, pls. i.-iii.

A very complete and exhaustive treatise, containing three parts: i. Description of the digestive apparatus of *Tegenaria*, taking for subject *T. domestica*, Linn., and *T. civilis*, Walck.; ii. Description of the digestive apparatus of *Agelena*, *Lycosa*, *Argyroneta*, *Amaurobius*, *Clubiona*, and *Epeira*; iii. Physiological observations and experiments on the digestion. Under this last head, the opinion that spiders swallow no more than the juices of their prey is abundantly confirmed. The whole work bears evident signs of careful observation and patient experiment. Some conclusions of former authors are shown to have been erroneous, while others are confirmed.

PAVESI, PIETRO. Sugli Aracnidi di Grecia. Rend. Ist. Lomb. (2) x. pp. 323-327.

Gives a list of 191 species of Greek Arachnids of 6 orders, 25 families, and 83 genera: *Scorpiones* 5 species, *Pseudo-scorpiones* 9, *Solifugæ* 3, *Opiliones* 18, *Araneæ* 151, *Acari* 5. Greece has, it appears, in common with Italy, 95 species, with Palestine and Syria 55, with Lower Egypt 38, with Turkey and Candia 37, with South Russia 35, with Tunis 28, with Dalmatia 19, and with Asia Minor 16. [None of the above countries can be said to have undergone any exhaustive search for Arachnids; the above comparison, therefore, can be but of little value.]

SIMON, EUGÈNE. Études Arachnologiques. 5^e Mémoire. Part ix. Arachnides recueillies aux Iles Philippines par MM. G. A. Baer et Laglaise. Ann. Soc. Ent. Fr. (5) vii. pp. 53-96, pl. iii. 6^e Mémoire. Part x. Arachnides nouveaux ou peu connus. L. c. pp. 225-242, pl. iii.

Pt. ix. records 42 species of *Araneidea*, of which 31 are described as new

belonging to the families *Salicidae* (in which two new genera are characterized), *Sphasidae*, *Lycosidae*, *Thomisidae*, *Epeiridae*, *Gasteracanthidae*, *Uloboridae*, *Theridiidae*, *Pholcidae*, *Drassidae* (the last with two new genera), and *Theraphosidae*. Two species of *Thelyphonidea*, 3 of *Scorpionidea* (2 new), and 3 of *Phalangidea* (all new), are also recorded.

Pt. x. records and describes, from various parts of the world, 1 new species of *Solpugidea* (*Tetracera*, Sim.), 7 species of *Araneidea* (6 new), and 4 of *Scorpionidea* (3 new). Of this last order, a new genus (*Cherilus*) is characterized.

(SIMON, E.) Bull. Soc. Ent. Fr. (5) v. [1875] p. cxlix., vi. [1876] p. clxxx., and vii. pp. xli. & lxxiv. *et seqq.*

Describes 10 spp. nn. of various families of *Araneidea* from different parts of France.

THORELL, T. Due Ragni esotici descritti. Ann. Mus. Genov. ix. [1876-7], pp. 301-310 (with woodcuts).

Describes and figures two spiders of the families *Epeiridae* and *Thomisidae*, each being the type of a new genus.

—. Studi sui Ragni Malesi e Papuani. *Op. cit.* x. pp. 341-634.

Records and describes 107 species and 10 new genera belonging to various families, all (excepting a few from Macassar) found in Kandari. Ten species only had before been described from the Celebes Islands, 6 of which are also contained in the collection here recorded. 93 species are described as new.

—. Descriptions of the *Araneæ* collected in Colorado in 1875 by A. S. Packard, jun., M.D. Bull. U. S. Geol. Surv. iii. pp. 477-529.

Records 30 species of *Araneidea*, comprised in 18 genera, belonging to the families *Epeiridae*, *Theridiidae*, *Scytodidae*, *Agelenidae*, *Thomisidae*, *Lycosidae*, and *Salticidae*; 22 of the species are described as new. Also 1 species of *Opiliones* [*Phalangidea*], described as new.

—. Sobre algunos Aracnidos de la República Argentina. Period. Zool. Argent. ii. pp. 201-218.

Comprises 6 known species of *Scorpiones*, 3 species of *Opiliones* (2 being new), and 1 sp. n. of *Pseudo-scorpiones*, from the Argentine Republic.

—. Études Scorpiologiques. Atti Soc. Ital. xix. [1876] pp. 75-272.

In the introductory remarks, the different parts of Scorpions are explained, and those parts are described, from which the essential characters are drawn (pp. 75-81). An analytical conspectus of families, sub-families, and genera is given (pp. 82-85); and at p. 86 is a diagram showing the author's views on the relative positions of the different groups of the *Arachnoidea*. Pp. 87-102 are occupied by a discussion upon evolution and natural selection, from which it appears that the author adopts a certain form of the doctrine of evolution, but dissents from that of natural selection as the agent by which evolution has been chiefly effected. Fifty-seven species of *Scorpionidea* are described, 38 being considered new, belonging to various families and genera. A list,

with notes upon some Scorpions (types of 7 species described by De Geer), "in Museo Holmiensi," is given (pp. 162-167).

H. C. COOK, P. Ac. Philad. 1877, pp. 308-312, describes the aeronautic flight of spiders from his own observations.

J. M. MEEK, Sci. Goss. 1877, p. 46, describes the symptoms consequent upon his son being bitten by the "Katipo," the "venomous spider of New Zealand" [*Latrodectus katipo*, Powell].

H. WEYENBERGH, in R. Napp's "Die Argentische Republik" (Buenos Aires: 1876, 8vo), pp. 184-186, enumerates Spiders from La Plata.

Nine species of Spiders (3 new, *Lycosa*, *Opilio*, and *Attus*), observed during O. Finsch's West Siberian Expedition, 1876, referred to in Catalog der Ausstellung ethnographischer und naturwissenschaftlicher Sammlungen (Bremen: 1877, 8vo).

C. F. W. T. WILLIAMS, Sci. Goss. 1877, pp. 207 & 208, gives a method of killing, preparing, preserving, and mounting spiders for the microscope.

ARANEIDEA.

THERAPHOSIDÆ.

Atrax, g. n., much like *Nemesia*, but without the characteristic spines at the extremity of the falces. O. P. Cambridge, Ann. N. H. (4) xx. p. 26. Type, *Atrax robustus*, sp. n., *id. l. c.* p. 27, pl. vi. fig. 1, New Holland.

Idiophthalma, g. n. Closely allied to *Idiops*, Perty, but differs in the position of the eyes. Type, *Idiophthalma suspecta*, sp. n., *id. l. c.* p. 27, pl. vi. fig. 2, Granada, S. America.

Aganippe, g. n. Intermediate between *Idicps* and *Eriodon*, *id. l. c.* p. 28. Type, *A. latior*, p. 29, pl. vi. fig. 4, West Australia, and *A. subtristis*, p. 28, fig. 3, Adelaide, *id. l. c.*, spp. nn.

Eriodon insignis, p. 29, fig. 5, and *E. incertus*, p. 30, Swan River, *id. l. c.*, spp. nn.

Ischnocolus baeri, Manilla, and *I. insularis*, Malamoy, Basilan, spp. nn., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 91.

Mygale stridulans, sp. n., J. Wood-Mason, Tr. E. Soc. 1877, pp. 281 & 282, pl. vii., Assam. The power of this spider to produce sounds is stated to be due to a "comb" composed of a number of highly elastic and indurated, club-shaped chitinous rods arranged together, comb-like, on the inner face of the basal joints of the palpi, and a "scraper" formed by an irregular row of sharp, erect spines, on the outer surface of the penultimate joints of the falces. These stridulating organs are equally developed in both sexes. [Cf. Ann. N. H. (4) xix.]

DRASSIDÆ.

Gnaphosa (Pythonissa) thorelli, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvii. p. 236, Switzerland. *G. conspersa* [|| Cambridge, 1872],

p. 489, and *G. scudderii*, p. 491, spp. nn., T. Thorell, Bull. U. S. Geol. Surv. iii., Colorado.

Prothesima melancholica, sp. n., *id.* l. c. p. 493, Colorado.

Drassus hamiger, *id.* Ann. Mus. Genov. x. p. 478, Kandari; *D. saussurii*, p. 227, Zermatt, Switzerland, and *D. pavesii*, p. 230, Oberwallis, Switzerland, Hermann Lebert, l. c.; *D. coloradensis*, J. H. Emerton, Bull. U. S. Geol. Surv. iii. p. 528, with fig., Colorado: spp. nn.

Corinna severa, sp. n., Thorell, l. c. p. 481, Kandari.

Cycais, g. n. Similar in general form to *Dysdera* and *Segestria*. Tarsal claws 3; eyes in two sub-parallel rows; laterals contiguous; considered to belong to the *Drasside* — near *Liocranum* and *Chiracanthium* in spite of possessing 3 tarsal claws. T. Thorell, l. c. p. 475. Type, *Cycais cylindrata*, sp. n., *id.* l. c. p. 476, Kandari.

Chiracanthium argenticomum, sp. n., Keyserling, l. c. p. 83, pl. iii. fig. 3, Madagascar.

Clubiona nigro-maculosa, sp. n., J. Blackwall, P. R. Irish Ac. (3) iii. p. 11, pl. ii. fig. 9, Seychelle Islands.

Stasina, g. n. Near *Agræca*, but nearer *Liocranum*; differs from the latter in the hinder row of eyes being curved behind, and the labium shorter and broader. The rows of eyes less curved than in *Agræca*. Fore part of caput broad. Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 89. Type, *S. vittata*, sp. n., *id.* l. c. p. 90, pl. iii. fig. 16, Malamoy, Bassilan.

Megera, g. n. Near *Agræca*, but eyes of first row very much larger; also near *Rhomalea*, L. Koch; Eugène Simon, l. c. p. 87. Type, *M. frenata*, sp. n., *id.* l. c. p. 88, pl. iii. figs. 11 & 11 A, Manilla.

Liocranum? (as *Sparassus*) *guttatum*, sp. n., J. Blackwall, l. c. p. 10, pl. i. fig. 8, Seychelle Islands.

ERESIDÆ.

Eresus cinnaberinus, Oliv., females (quite black) discovered and described for the first time; P. Bertkau, Verh. Ver. Rheinl. (5) iv. pp. 267-282.

DICTYNIDÆ.

Dictyna borealis, sp. n., O. P. Cambridge, Ann. N. H. (4) xx. p. 273, pl. viii. fig. 1, North Greenland. *D. sedilloti*, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) v. [1875] p. cl., Castellane and Carcassone.

Lethia narbonensis, sp. n., Simon, *op. cit.* vi. [1876]. p. clxxxii., Narbonne.

AGELENIDÆ.

Tegenaria detestabilis, sp. n., O. P. Cambridge, Ann. N. H. (4) xx. p. 275, Dobbin Bay, Arctic Regions. *F. heteropalpa*, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvi. p. 209, pl. vi. fig. 41, Oberwallis, Switzerland.

Habronestes ornatus, sp. n., H. H. B. Bradley, P. Linn. Soc. N. S. W. ii. p. 119, Cocoonut Island.

Agelena mengii, sp. n., Lebert, l. c. p. 211, pl. vi. fig. 42, Aarau, Switzerland.

HERSILIIDÆ.

Hersilia celebensis, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 472, Kandari.

SCYTODIDÆ.

Micromerys, g. n. With six eyes; allied to *Scytodes*, p. 118, for *M. gracilis*, sp. n., p. 119, H. H. B. Bradley, P. Linn. Soc. N. S. W. ii., Capo York.

PHOLCIDÆ.

Pholcus pullulus, Hentz, from Colorado, U. S.; T. Thorell, Bull. U. S. Geol. Surv. iii. p. 487.

THERIDIIDÆ.

Theridium amicum, p. 463, *T. simplex*, p. 466, *T. atratum*, p. 467, spp. nn., T. Thorell, Ann. Mus. Genov. x. *T. carolinum*, sp. n., A. G. Butler, P. Z. S. 1877, p. 75, Galapagos Islands [evidently a *Latrodectus*]. *T. placens*, p. 13, pl. ii. fig. 10, and *T. leve*, p. 14, spp. nn., J. Blackwall, P. R. Irish Ac. (2) iii. Seychelle Islands. *T. camurum*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 85, Malamoy, Bassilan (Philippine Islands). *T. dubium*, sp. n., H. H. B. Bradley, P. Linn. Soc. N. S. W. ii. p. 116, Hall Sound.

Steatoda distincta, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. No. 2, p. 485, Colorado.

Lithyphantes corollatus, Linn., id. l. c. p. 487, Colorado.

Latrodectus apicalis, sp. n., A. G. Butler, P. Z. S. 1877, p. 75, pl. xiii. figs. 2, 2 A, 2 B, & 2 C, Galapagos Islands.

Euryopsis aneo-cincta, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 84, Malamoy, Bassilan (Philippine Islands). *E. microthorax*, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvii. p. 185, pl. vi. fig. 41, Geneva.

Erigone whymperi, p. 276, fig. 2, N. Greenland, *E. provocans*, p. 279, fig. 5, Arctic Expedition, lat. 82° 27' and 82° 33', and *E. vexatrix*, p. 280, fig. 6, Arctic Expedition, O. P. Cambridge, Ann. N. H. (4) xx. pl. viii. *E. cacuminum*, p. 482, and *E. strabo*, p. 483, spp. nn., T. Thorell, Bull. U. S. Geol. Surv. ii. No. 2, Colorado. *E. muscorum*, p. 192, Verney, *E. brunneo-nigra*, p. 194, Chur, and *E. kochi*, p. 195, spp. nn., Hermann Lebert, N. Denk. schw. Ges. xxvii., Switzerland.

Linyphia turbatrix, sp. n., O. P. Cambridge, Ann. N. H. (4) xx. p. 281, N. Greenland. *L. orophila*, sp. n., T. Thorell, l. c. p. 480, Colorado.

Bathypantes gracilis, p. 161, Jura Mountains, and *B. charpentieri*, p. 163, pl. iv. figs. 29-35, Salt mines of Bex and other subterranean localities, spp. nn., Hermann Lebert, N. Denk. schw. Ges. xxvii.

Rhomphæa angulipalpis, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 469, Kandari.

Argyrodes vittata, sp. n., H. H. B. Bradley, P. Linn. Soc. N. S. W. ii. p. 115, New Guinea. *A. tripunctatus*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 86, Malamoy, Bassilan (Philippine Islands). *A. rostrata*, p. 14, pl. ii. fig. 11, and *A. cognata* (sub *Epeira*), p. 17, fig. 12, spp. nn., J. Blackwall, P. R. Irish Ac. (2) iii., Seychelle Islands. *A. tenuis*, p. 457, and *A. fragilis*, p. 460, spp. nn., T. Thorell, Ann. Mus. Genov. x., Kandari.

PHORONCIDIIDÆ.

Phoroncidia aciculata, sp. n., T. Thorell, l. c. p. 455, Kandari. *P. aurata*, sp. n., O. P. Cambridge, Ann. N. H. (4) xx. p. 31, pl. vii. fig. 9, Madagascar.

EPEIRIDÆ.

Meta fastuosa, p. 413, *M. elegans*, p. 416, *M. auro-cincta*, p. 418, *M. ventralis*, p. 423, Kandari, *M. striata*, p. 427, Amboina and Kandari, *M. pumila*, p. 429, *M. fusiformis*, p. 431, and *M. soror*, p. 433, Kandari, spp. nn., T. Thorell, Ann. Mus. Genov. x. *M. thorelli*, sp. n., J. Blackwall, P. R. Irish Ac. (2) iii. p. 21, pl. ii. fig. 15, Seychelle Islands. *M. fastigata*, p. 79, pl. iii. fig. 10, and *M. tredecim-guttata*, p. 80, spp. nn., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii., Malamoy, Bassilan (Philippine Islands). *M. subterranea*, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvii. p. 137, subterranean galleries at Bex, Switzerland.

Tetragnatha elongata, Walck.: two varieties fully described; T. Thorell, Bull. U. S. Geol. Surv. iii. p. 477, Colorado. *T. minatoria*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 83, Manilla. *T. minax*, sp. n., J. Blackwall, l. c. p. 20, pl. ii. fig. 14, Seychelle Islands. *T. latifrons*, p. 434, *T. pulchella*, p. 438, *T. leptognatha*, p. 441, *M. anguilla*, p. 443, spp. nn., T. Thorell, Ann. Mus. Genov. x., Kandari.

Nephila wallacii, sp. n., T. Thorell, l. c. p. 449, Kandari. *N. plumipes*, C. L. Koch: ♂ figured and described; J. Blackwall, P. R. Irish Ac. (2) iii. p. 19, pl. ii. fig. 13, Seychelle Islands. *N. bari*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 82, Manilla.

Argiope browni, sp. n., O. P. Cambridge, P. Z. S. 1877, p. 284, Duke of York Island. *A. luzona*, Walck., p. 74, Manilla, and *A. intricata*, sp. n., p. 75, Malamoy, Eugène Simon, l. c. *A. chloreis*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 368, Kandari.

Herennia, g. n. Allied to *Argiope*, but differs in the position of the eyes, the convexity of the front row being directed backwards. The laterals are separated by a distinct interval, and not far from the centrals, which last form nearly a square, a little longer than broad. Abdominal cuticle rather hard. Type, *Epeira multipunctata*, Dol. T. Thorell, l. c. p. 370, Kandari.

Arachnura digitata, sp. n., *id.* l. c. p. 410, Kandari.

Cyclosa dives, p. 71, and *C. melanura*, p. 72, Malamoy, Bassilan, spp. nn., Eugène Simon, l. c.

Cyrtophora cephalotes, sp. n., Eugène Simon, *l. c.* p. 73, pl. iii. fig. 8, Malamoy, Bassilan.

Epeira cooksoni, sp. n., A. G. Butler, P. Z. S. 1877, p. 76, pl. xiii. figs. 2, 2 A, 2 B, & 2 C, Galapagos (Charles and Albemarle) Islands. *E. striatipes*, p. 76, *E. nox*, p. 77, *E. laglaisii*, p. 77, *E. porcula*, p. 78, pl. iii. figs. 7 & 7 A, spp. nn., Eugène Simon, *l. c.*, Malamoy, Bassilan. *E. obscura*, sp. n., J. Blackwall, *l. c.* p. 15, Seychelle Islands [undoubtedly = *E. nocturna*, Vinson]. *E. kandarensis*, p. 372, and *E. pfeifferæ*, p. 375, Kandari, *E. decens*, p. 379, Macassar, *E. vatia*, p. 382, Kandari, *E. pullata*, p. 385, Kandari and Macassar, *E. pilula*, p. 388, Kandari and Amboina, *E. enyoides*, p. 396, *E. acropyga*, p. 398, *E. oxyura*, p. 400, *E. macrura*, p. 402, *E. myura*, p. 406, and *E. longicauda*, p. 408, Kandari, spp. nn., T. Thorell, Ann. Mus. Genov. x. *E. aculeata*, sp. n., J. H. Emerton, Bull. U. S. Geol. Surv. iii. p. 528, fig., Colorado.

GASTERACANTHIDÆ.

Cyrtarachne levis, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 361, Kandari. *C. longipes*, p. 559, pl. lvi. fig. 1, River Coanza, *C. furcata*, p. 560, fig. 2, Rockhampton, and *C. hobsoni*, p. 562, fig. 3, Bombay and Ceylon, spp. nn., O. P. Cambridge, P. Z. S. 1877.

Paraplectana depressa, p. 354, *P. picta*, p. 356, and *P. villosa*, p. 359, spp. nn., T. Thorell, *l. c.*, Kandari. *P. maritata*, p. 32, pl. vii. fig. 7, Ceylon, *P. decora*, p. 34, fig. 8, Rio Grande, S. America, and *P. kochi*, p. 35, fig. 10, Cape York, spp. nn., C. P. Cambridge, *l. c.*

Gasteracantha beccarii, p. 347, and *G. butleri*, p. 350, spp. nn., T. Thorell, *l. c.*, Kandari. *G. scoparia*, p. 63, pl. iii. figs. 1 & 1 A, Laguna, and *G. recurva*, p. 70, fig. 2, Manilla, spp. nn., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. *G. insularis*, Thor.; A. G. Butler, P. Z. S. 1877, p. 76, pl. xiii. figs. 1, 1 A, 1 B, & 1 C, Galapagos (Charles and Albemarle) Islands. *G. panisicca*, Butler; O. P. Cambridge, P. Z. S. 1877, p. 285, Duke of York Island, New Britain, or New Ireland. *G. pseudo-flava*, p. 228, pl. iii. fig. 4, and *G. circum-notata*, p. 229, Gilolo, Moluccas, *G. doria*, p. 232, pl. iii. fig. 3, Sarawak, *G. sylvestris*, p. 234, fig. 6, *G. relegata*, p. 235, and *G. gambeyi*, p. 236, fig. 5, New Caledonia, spp. nn., *G. pre-testata*, Dol., nec Walck., renamed *doleschalli*, p. 227; Eugène Simon, *l. c.*

ARCYIDÆ.

Augusta, g. n. Allied to *Arcys*, for *Augusta papilionacea*, sp. n. O. P. Cambridge, Ann. N. H. (4) xx. p. 37, pl. vii. fig. 6, Madagascar.

POLTIDÆ.

Daturina, g. n., for *D. hystrix*, sp. n.; T. Thorell, Ann. Mus. Genov. ix. [1876-7] p. 302, with woodcut, California [undoubtedly = *Pycnanantha*, Bl.].

CRYPTOTHELIDÆ.

Cryptothele ceylonica, sp. n., O. P. Cambridge, P. Z. S. 1877, p. 563, pl. lvi. fig. 4, Ceylon.

ERIPIDÆ.

Eripus quinque-gibbosus, sp. n., Cambridge, l. c. p. 564, fig. 5, Minas Geraes.

THOMISIDÆ.

Dica livens, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) vi. [1876] p. clxxxii, Ste. Baume, Dept. Var. *D. lepida*, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. p. 498, Colorado. *D. insignis*, p. 513, and *D. concinna*, p. 516, spp. nn., *id.* Ann. Mus. Genov. x., Kandari.

Thomisus laglaisii, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 65, Laguna.

Misumena nitida, p. 508, *M. flavens*, p. 510, and *M. hilaris*, p. 511, spp. nn., T. Thorell, Ann. Mus. Genov. x.

Pistius annulipes, p. 501, *P. bipunctatus*, p. 504, and *P. duriusculus*, p. 505, spp. nn., *id.* l. c.

Loxobates, g. n., p. 494. Near to *Thomisus*, but differs in the very elevated cephalothorax, and in the position of the eyes. Ocular area small, crescent-shaped. Claw-tufts very distinct. Type, *L. ephippiatus*, p. 495, sp. n., Kandari. T. Thorell, Ann. Mus. Genov. x.

Cerinius, g. n. Allied to *Dica* and *Xysticus*, especially to the former, in the strongly recurved hinder row of eyes, which is scarcely longer than the front row, and the eyes of which form a trapezium. Type, *C. fuscus*, sp. n., T. Thorell, l. c. p. 518, Kandari.

Oxyptila conspurcata, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. p. 496. *O. baudueri*, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) vii. p. xli., Sos (Lot-et-Garonne).

Xysticus ovatus, Barèges and St. Sauveur, and *X. perileucus*, Fontainebleau, spp. nn., Eugène Simon, Bull. Soc. Ent. Fr. (5) vi. [1876], p. clxxx. *X.* (as *Thomisus*) *insularis*, sp. n., J. Blackwall, P. R. Irish Ac. (2) iii. p. 7, pl. i. fig. 6, Seychelle Islands. *X. cunctata*, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. p. 494, Colorado.

Thomisoides utriformis, sp. n., A. G. Butler, P. Z. S. 1877, p. 77, pl. xiii. figs. 4, 4 A, 4 B, & 4 C, Galapagos Islands.

Cladonotus, g. n., p. 305. Type, *C. jobiensis*, p. 306, sp. n. T. Thorell, Ann. Mus. Genov. ix. (with woodcut), Jobi, near New Guinea.

Nyctimus, g. n., p. 498. Eyes very like *Platythomisus*, Dol., and *Porropis*, L. Koch. Not very unlike *Xysticus*, excepting in the elevated cephalothorax. Ocular area occupies the whole width of the fore part of caput. Lateral eyes large. Type, *N. bistriatus*, p. 499, sp. n., T. Thorell, l. c. x. Kandari.

Epidius, g. n., p. 491. Allied to *Heteropoda*, Latr. Type, *E. longipalpis*, sp. n., p. 492, Kandari. *Id.* l. c.

Palystes ornatus, sp. n., *id.* l. c. p. 488, Kandari.

Heteropoda bivittata, sp. n., *id.* l. c. p. 485, Kandari. *H. gemella*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 64, Manilla.

Isopeda (as *Olios*) *valida*, sp. n., J. Blackwall, l. c. p. 8, pl. i. fig. 7, Seychelle Islands.

Sarotes vulpinus, sp. n., O. P. Cambridge, P. Z. S. 1877, p. 286, Duke of York Island.

Philodromus albo-pictus, sp. n., Eugène Simon, Bull. Soc. Ent. Fr., (5) v. [1875], p. cxlix. Laplaque, Dept. Gers. *P. virescens*, p. 500, and *P. inquisitor*, p. 502, spp. nn., Thorell, Bull. U. S. Geol. Surv. iii. Colorado.

PODOPHTHALMIDÆ.

Podophthalma elliotti, p. 567, pl. lviii. fig. 6, East Central India, *P. affinitata*, p. 569, River Coanza, *P. hilaris*, p. 569, fig. 7, Madagascar, *P. incerta*, p. 570, fig. 8, Madagascar, and *P. diversa*, p. 572, fig. 9, Minas Geraes, spp. nn., O. P. Cambridge, P. Z. S. 1877.

SPHASIDÆ.

Oxyopes gracilis, sp. n., Eugen von Keyserling, Verh. z.-b. Wien, xxvi. p. 698, pl. viii. figs. 63 & 64, Baltimore, Illinois, Bahia, and N. Granada. *O. tenuatus*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 534, Kandari. *O. concolor*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 62, Malamoy, Bassilan.

Pasithea (Peucetia, Thor.) flava, p. 700, pl. viii. figs. 65 & 66, Brazil, New Friburg, *P. thalassina*, p. 702, figs. 67-69, Mexico, Oaxaca, *P. rubro-lineata*, p. 704, figs. 70 & 71, Sta. Fé de Bogota, and *P. similis*, p. 705, fig. 72, Bahia, spp. nn., *id. l. c.*

LYCOSIDÆ.

Eugen von Keyserling, Verh. z.-b. Wien, xxvi. p. 680, characterizes a new family, *Ctenoidæ*, for the genus *Ctenus*, "tarsal claws two, with claw-tuft beneath; eyes in three rows," dividing it into several genera, according to the number of spines beneath the tibiæ of the first and second pairs of legs.

Ctenus (sensu stricto); four pairs of spines under tibiæ of first pair of legs. *C. granadensis*, p. 682, pl. viii. figs. 51 & 52, and *C. bogotensis*, p. 684, fig. 54, Sta. Fé de Bogota, *C. sallei* [?] *sallei*, p. 685, fig. 53, Mexico (Vera Cruz and Cordova), spp. nn., *id. l. c.*

Microctenus, g. n.; five pairs of spines under tibiæ of first pair of legs. *M. ornatus*, p. 81, pl. viii. fig. 62, and *M. obscurus*, p. 689, fig. 58, St. Fé de Bogota, *M. adustus*, p. 690, fig. 57, New Granada, *M. parvus*, p. 692, fig. 55, Sta. Fé de Bogota, spp. nn., *id. l. c.*

Acanthoctenus, g. n.; nine pairs of spines under tibiæ of first pair of legs. *A. spinigerus*, p. 693, pl. viii. fig. 60, Mexico, Cordova, and *A. spinipes*, p. 695, fig. 61, Sta. Fé de Bogota, spp. nn., *id. l. c.*

Caloctenus, g. n.; seven pairs of spines under tibiæ of first and second pairs of legs, p. 696. *C. aculeatus*, p. 697, pl. viii. fig. 59, sp. n., *id. l. c.* St. Fé de Bogota.

Aulonia micarioides, sp. n., L. Koch, Die Arachn. Austr. p. 961, pls. lxxxiii. fig. 6, & lxxxiv. fig. 1, Bowen and Port Mackay.

Pardosa vicaria, p. 965, pl. lxxxiv. fig. 3, New Zealand, and *P. versicolor*, p. 966, pl. lxxxiv. figs. 4 & 5, Sydney, spp. nn., L. Koch, l. c.

Trabea australiensis, sp. n., *id. l. c.* p. 968, pl. lxxxiv. fig. 6.

Sphedanus, g. n., p. 522. Approaches the *Agelenides* in the position of the eyes and the form of the tarsal claws, but is nearer to *Dolomedes* and *Ocyale*, in the dense pubescence with which it is covered, and in its whole appearance. From these last genera the smaller intervals between the lateral eyes, and between the fore and hind central pairs, at once distinguish it. Type, *S. undatus*, p. 523, sp. n., T. Thorell, Ann. Mus. Genov. x., Kandari.

Dolomedes scapularis, C. L. Koch, p. 676, pl. viii. fig. 49, New Orleans, N. America, and *D. marginellus*, L. Koch, p. 678, fig. 50, Sta. Fé de Bogota; Eugen von Keyserling, Verh. z.-b. Wien, xxvi. *D. annulatus*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 63, Manilla.

Diapontia, g. n., p. 670. Between *Pirata* and *Dolomedes*, for *D. freiburgensis*, p. 671, pl. viii. figs. 45 & 46, New Friburg, *D. granadensis*, p. 673, fig. 47, New Granada, and *D. uruguayensis*, p. 675, fig. 48, Uruguay, spp. nn., Keyserling, l. c.

Pirata prodigiosa, sp. n., *id. l. c.* p. 669, pl. viii. fig. 44, Illinois; *P. subligatus*, sp. n., L. Koch, Die Arachn. Austr. p. 963, pl. lxxxiv. fig. 2, Bowen.

Trachosa helvipes, p. 659, pls. vii. figs. 35 & 36 A, & viii. fig. 37, Baltimore; *T. avara*, p. 661, figs. 38 & 39, N. America, *T. rubicunda*, p. 663, fig. 40, Baltimore, *T. tenebrosa*, p. 665, fig. 41, and *T. tenella*, p. 667, figs. 42 & 43, New Granada and Sta. Fé de Bogota, spp. nn., Keyserling, l. c. *T. conspersa*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 529, Kandari.

Tarentula modesta, p. 626, pl. vii. figs. 11 & 12, Baltimore, *T. pulchra*, p. 628, figs. 13 & 14, *T. lepida*, p. 631, fig. 15, *T. baltimoriana*, p. 632, fig. 16, *T. inhonesta*, p. 634, fig. 17, *T. kochi*, p. 636, fig. 18, North America, *T. pugnatrice*, p. 637, fig. 19, Martinique, *T. badia*, p. 639, figs. 20 & 21, *T. fusca*, p. 640, fig. 22, Cuba, *T. stygia*, p. 642, fig. 23, Chili, *T. granadensis*, p. 646, fig. 26, New Granada and Sta. Fé de Bogota, *T. horrida*, p. 648, fig. 27, Sta. Fé de Bogota, *T. thorelli*, p. 650, fig. 28, *T. bogotensis*, p. 651, figs. 29-31, New Granada, *T. pulchella*, p. 654, fig. 32, *T. rubro-teniata*, p. 656, fig. 34, *T. aussereri*, p. 657, fig. 33, Sta. Fé de Bogota, spp. nn., Eugen von Keyserling, Verh. z.-b. Wien, xxvi. *T. exasperans*, sp. n., O. P. Cambridge, Ann. N. H. (4) xx. p. 283, pl. viii. fig. 7, Arctic Regions. *T. modesta*, p. 520, and *T. scalaris*, p. 521, T. Thorell, Bull. U. S. Geol. Surv. iii. Colorado.

Lycosa bernensis, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvii. p. 290, Berne, *L. sternalis*, p. 504, *L. concinna*, p. 506, *L. uncata*, p. 508, *L. tristis*, p. 510, *L. indagatrix*, p. 512, *L. impavida*, p. 513, *L. iracunda*, p. 514, and *L. sinistra*, p. 517, spp. nn., T. Thorell, l. c. Colorado. *L. figurata*, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) vi. [1876] p. clxxxi., St. Juste (near Limoges). *L. rufa*, p. 613, pl. vii. fig. 2, Baltimore and Peoria, *L. minima*, p. 614, fig. 3, Illinois, *L. flavipes*, p. 616, fig. 4, *L. fastuosa*, p. 618, figs. 5 & 6, *L. mackenziana*, p. 621, fig. 7, Mackenzie River, *L. xerampelina*, p. 622, fig. 8, Illinois, and *L. rugosa*,

p. 624, figs. 9 & 10, spp. nn., Eugen von Keyserling, Verh. z.-b. Wien, xxvi. *L. speciosa*, p. 890, pl. lxxvii. fig. 1, Caigan, *L. tristicula*, fig. 2, Sydney, N.S.W., spp. nn.; *L. leuckarti*, Thor., p. 896, pl. lxxvii. fig. 3, & pl. lxxxi. fig. 1, Peak Downs; *L. pictiventris*, p. 899, pl. lxxvii. figs. 4 & 5, Sydney, Rockhampton, and Brisbane, *L. ornatula*, p. 902, pl. lxxvii. fig. 6, Bowen and Rockhampton, spp. nn.; *L. furcillata*, L. Koch, p. 903, pl. lxxviii. figs. 1 & 2, Sydney; *L. palabunda*, p. 906, pl. lxxviii. figs. 3 & 4, Sydney, Gayndah, Rockhampton, and South Sea Islands, *L. semicincta*, p. 908, pl. lxxviii. fig. 5, Rockhampton and Gayndah, *L. ramosa*, p. 910, pl. lxxviii. fig. 6, New Holland, *L. clura*, p. 912, pl. lxxix. fig. 1, Bowen, spp. nn.; *L. vulpecula*, L. Koch, p. 914, pl. lxxix. fig. 2, Wallis Island; *L. scenica*, p. 915, pl. lxxix. fig. 3, New Zealand, *L. expolita*, p. 917, pl. lxxix. figs. 4 & 5, Port Denison and Brisbane, *L. hilaris*, p. 920, pl. lxxix. fig. 6, and *L. umbrata*, p. 921, pl. lxxix. fig. 7, New Zealand, *L. crispipes*, p. 923, pl. lxxix. fig. 8, & lxxx. fig. 1, Bowen and Rockhampton, *L. pruinosa*, p. 925, pl. lxxx. fig. 2, Sydney, *L. festina*, p. 927, pl. lxxx. figs. 3 & 4, Rockhampton, Bowen, Peak Downs, and Port Mackay, *L. serrata*, p. 930, pl. lxxx. figs. 5 & 6, Sydney, *L. infensa*, p. 932, pl. lxxx. fig. 7, Sydney and Rockhampton, *L. fallax*, p. 934, pl. lxxx. fig. 8, Bowen, *L. egena*, p. 935, pl. lxxxi. fig. 2, Cape York, *L. berenice*, p. 937, pl. lxxxi. fig. 3, Australia, *L. inornata*, p. 938, pl. lxxxi. fig. 4, Upolu, *L. hostilis*, p. 939, pl. lxxxi. fig. 5, Ovalau, *L. pulvere-sparsa*, p. 941, pl. lxxxi. fig. 6, Rockhampton, *L. leta*, p. 944, pl. lxxxi. fig. 7, & pl. lxxxii. fig. 1, Rockhampton, Bowen, and Peak Downs, *L. senilis*, p. 946, pl. lxxxii. fig. 2, Sydney and Rockhampton, *L. leucophaea*, p. 948, pl. lxxxii. fig. 3, Rockhampton, *L. flavisternis*, p. 950, pl. lxxxii. figs. 4 & 5, Peak Downs, Bowen, Rockhampton, Port Mackay, and Sydney, *L. lacertosa*, p. 952, pl. lxxxii. fig. 6, Adelaide, *L. obscura*, p. 954, pl. lxxxiii. figs. 1 & 2, Sydney, Bowen, Rockhampton, Peak Downs, and Gayndah, spp. nn.; *L. godeffroyi*, L. Koch, p. 957, pl. lxxxiii. figs. 3 & 4, Sydney, Peak Downs, Wollongong, and Sydney; *L. hasselti*, sp. n.: Ludwig Koch, Die Arachn. Austr.

Artoria, g. n. Differs from other known Lycosids in the four posterior eyes forming a trapezium a little broader in front than behind; reversing the normal plan. Type, *A. parvula*, sp. n., T. Thorell, Ann. Mus. Genov. x. Kandari.

Dendrolycosa longitarsis, sp. n., *id. l. c.* p. 525, Kandari.

DINOPIDÆ.

The position of this family is considered doubtful. Its place (according to L. Koch) in the family *Eresidae* is considered quite untenable. O. P. Cambridge, P. Z. S. 1877, pp. 558 & 573.

Avella, g. n., p. 574. Allied to *Dinopis*, Macleay, and still nearer to *Menneus*, Sim.; differs from *Dinopis* in not possessing the enormous pair of fore-central eyes; also in having the tarsi of the first pair of legs subdivided; from *Menneus*, in several important points of structure. Type, *A. despiciens*, sp. n., O. P. Cambridge, *l. c.* p. 574, pl. lvii. fig. 10, Rockhampton.

SALTICIDÆ.

Eვენus, g. n. Allied to *Lyssomanes*, Hentz; forming a link between it and the ordinary forms. Type, *E. tener*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 59, pl. iii. fig. 12, Malamoy, Bassilan.

Athamas, g. n., p. 575. Allied to *Lyssomanes*, Hentz, and *Jelskia*, Tacz., differs in the shortness of the cephalothorax and abdomen, as well as in some other characters, notably the relative proportion of the spinners. Type, *A. whitmei*, p. 576, sp. n., O. P. Cambridge, P. Z. S. 1877, pl. lvi. fig. 11, Samoa Island.

Lyssomanes pallens, sp. n., J. Blackwall, P. R. Irish Ac. (2) iii. p. 6, pl. i. fig. 5, Seychelle Islands.

Attus zimmermanni, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) vii. p. lxxiv., Silesia. *A.* (as *Salticus*) *brighii*, p. 2, pl. i. fig. 1, and *A. acutus*, p. 3, fig. 2, spp. nn., J. Blackwall, P. R. Irish Ac. (3) iii. Seychelle Islands, *A. solaris*, sp. n., A. Menge, Preuss. Spinnen, p. 486, pl. lxxx. fig. 275, Prussia. *A. erraticus*, Walck., *id. l. c.* pl. lxxx. fig. 278 [probably sp. n.]. *A. pubescens*, Fabr., *id. l. c.* pl. lxxxi. fig. 279, Prussia [probably sp. n.]. *A. nigripulps*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 620, Kandari.

Dendryphantes riparius, sp. n., Hermann Lebert, N. Denk. schw. Ges. xxvii. p. 304, pl. vi. fig. 44, Oberwallis.

Ælurops simoni, sp. n., *id. l. c.* p. 310, pl. vi. figs. 45-47, Oberwallis.

Yllenus brueggeri, sp. n., *id. l. c.* p. 313, pl. vi. figs. 48 & 49, Grisons.

Pellenes bilulunatus, sp. n., Eugène Simon, Bull. Soc. Ent. Fr. (5) vii. p. lxxv. Penne, Département du Tarn.

Phidippus coloradensis, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. p. 523; Colorado.

Heliophanus (as *Salticus*) *activus*, sp. n., J. Blackwall, P. R. Irish Ac. (2) iii. p. 4, pl. i. fig. 3, Seychelle Islands.

Salticus constrictus, sp. n., *id. l. c.* p. 5, pl. i. fig. 4, Seychelle Islands. *S. augustus*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 553, Kandari.

Agorius, g. n., p. 556. Allied to *Salticus*, Latr.-Sim., *Leptorchestes*, Thor., and *Synagele*, Sim. Differs in the sternum not being produced between the coxæ of the first pair of legs; in the shorter, ocular quadrangle, and in the unusual structure of the first pair of legs, which are more like those of *Diolenius*, Thor. Type, *A. gracilipes*, p. 557, sp. n., T. Thorell, Ann. Mus. Genov. x., Kandari.

Marpesia, g. n., p. 471. Allied closely to *Marpessa*, C. L. Koch; for *M. arenicola*, p. 472, sp. n., A. Menge, Preuss. Spinn. pl. lxxviii. fig. 266, Ostsee.

Ædipus, g. n. Allied to *Dendryphantes*. For *Æ. ænescens*, sp. n., *id. l. c.* p. 482, pl. lxxix. fig. 273, Prussia.

Scartes, g. n., p. 494, for *S. parvulus*, p. 495, pl. lxxxi. fig. 282, sp. n., *id. l. c.* Prussia [apparently a *Heliophanus*].

Phileus chrysops, Poda, *id. l. c.* p. 477, pl. lxxviii. fig. 270, Prussia. [Does not appear to be the *Salticus sanguinolentus*, Linn. et al.].

Synemosyna procera, p. 538, *S. mavsta*, p. 541, *S. nigra*, p. 544, *S. nitidis-*

sima, p. 546, *S. clavigera*, p. 548, Kandari, and *S. rufescens*, p. 552, Macassar, spp. nn., T. Thorell, Ann. Mus. Genov. x.

Marptusa, g. n., substituted for *Marpessa*, C. L. Koch, 1846, *nee* Gray (Moll.), 1821; *id. l. c.* p. 561. *M. humilis*, sp. n., *id. l. c.*, Kandari.

Saitis ? *testacea*, sp. n., *id. l. c.* p. 565, Kandari.

Viricia, g. n., p. 573. Formed for a portion of *Mavia*, C. L. Koch. Differs from *Mavia*, Sim., in the relative length of some joints of the first and fourth pairs of legs; the fore central eyes are also more prominent and further separated from the fore laterals. For *V. pavesii*, p. 574, and *V. pallens*, p. 579, *id. l. c.*, Kandari.

Ursarius *paykulli*, Sav.; Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 53, Manilla.

Plexippus *gulosus*, p. 54, Manilla, and *P. curtus*, p. 55, Malamoy, Ile Bassilan, spp. nn., *id. l. c.*

Plexippus *ardelio*, p. 602, Macassar, *P. ensifer*, p. 606, *P. validus*, p. 610, *P. chalccephalus*, p. 613, *P. ? samio*, p. 617, spp. nn., T. Thorell, Ann. Mus. Genov. x., Kandari.

Evophrys *late-fasciata*, p. 56, and *E. semi-argentea*, p. 57, spp. nn. Eugène Simon, Ann. Soc. Ent. Fr. (5) vii., Malamoy, Ile Bassilan.

Menemerus *vittatus*, sp. n., *id. l. c.* p. 59, Manilla. *M. trivialis*, sp. n., T. Thorell, Ann. Mus. Genov. x. p. 571, Kandari.

Bavia, g. n., p. 60. Near to *Mavia*, C. L. Koch, and *Icius*, Sim. Caput relatively longer in proportion to the thorax; and the legs of the fourth pair without spines on the tibiae and metatarsi. Type, *B. ariceps*, p. 61, sp. n., Eugène Simon, *l. c.*, Manilla.

Mavia *latruncula*, p. 581, *M. mundula*, p. 584, and *M. ombria*, p. 588, spp. nn., T. Thorell, Ann. Mus. Genov. x., Kandari.

Thiania ? *albo-cincta*, sp. n., *id. l. c.* p. 591, Kandari.

Cocalus *salax*, sp. n., *id. l. c.* p. 594, Kandari.

Ciris *relucens*, sp. n., *id. l. c.* p. 623, Kandari.

Ballus *brachiatus*, sp. n., *id. l. c.* p. 626, Kandari.

Homalattus *margarops*, p. 629, and *H. hirsutus*, p. 632, spp. nn., *id. l. c.* Kandari.

THELYPHONIDEA.

PHRYNIDÆ.

Phrynus *grayi*, P. Gervais; Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 92, Manilla.

THELYPHONIDÆ.

Thelyphonus *manillanus*, C. L. Koch; *id. l. c.* p. 92, Manilla.

SCORPIONIDEA.

SCORPIONIDÆ.

Ischnurus *pistaceus*, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 93, Manilla. *I. neo-caledonicus*, sp. n., *id. l. c.* p. 237, New Caledonia.

Isometrus armillatus, sp. n., Simon, *l. c.* p. 94, Manilla. *I. crassimanis*, p. 129, Mexico, *I. stigmurus*, p. 132, S. America, *I. antillanus*, p. 134, Antilles, E. Indies, *I. variatus*, p. 136, New Holland, *I. gracilis*, p. 139, Australia, *I. fuscus*, p. 140, Cordova, S. America, spp. nn., T. Thorell, Atti Soc. Ital. xix.

Charilus [Chae-], g. n. Allied to *Uroctonus*, Thor. Differs in form of sternum; in *Uroctonus* it is much broader than long, and the "combs" have ten lamellæ and two rows of "pièces." Type, *C. variegatus*, sp. n., Simon, *l. c.* p. 239, pl. iii. fig. 13, Java.

Broteas herbsti, Thor., p. 240, S. Brazil, La Plata, and *B. granulatus*, p. 241, sp. n., Cayenne, Maroni, *id. l. c.*

Buthus villosus, Pet., = *Scorpio australis*, Herbst, *Phonurus* (*Androctonus*) *villosus*, Pet., and *Buthus craturus*, Thor.; T. Thorell, Atti Soc. Ital. xix. pp. 103-106, Africa. *B. doriae*, p. 107, Persia, *B. brevimanus*, p. 110, S. Africa, *B. hedenborgi*, p. 113, Syria, and *B. conspersus*, spp. nn., *id. l. c.*, S. Africa.

Lepreus pilosus, Thor., p. 118, and *L. vittatus*, sp. n., p. 121, Caffraria, *id. l. c.*

Tityus triangulifer, sp. n., *id. l. c.* p. 123, S. Africa.

Phassus colombianus, Thor.; *id. l. c.* p. 127, Bogota.

Rhopalurus laticauda, Thor.; *id. l. c.* p. 143, Bogota.

Centrurus elegans, p. 145 (? Mexico or Java), *C. insulanus*, p. 148, California, *C. nitidus*, p. 152, S. Domingo, *C. tenuis*, p. 153, Antilles, S. Domingo, and New York?, *C. granosus*, p. 155, Island St. Joseph, Gulf of Panama, *C. bertholdi*, p. 158, Mexico, spp. nn., and *C. testaceus*, Duf., p. 160, America, *id. l. c.*

Bothriurus vittatus, Guér., p. 168, Brazil, and *B. dorbignii*, Guér., p. 170, Bolivia and Cordova, *id. l. c.*

Telegonus weyenberghi, p. 173, and *T. ferrugineus*, p. 176, spp. nn., *id. l. c.*, Cordova.

Cercophonius squama, Gerv., p. 178, Australia, and *C. brachycentrus*, p. 180, St. Juan and Cordova, spp. nn., *id. l. c.*

Vejovis intrepidus, Thor.; *id. l. c.* p. 183, Mexico.

Hadrurus maculatus, sp. n., p. 186, Callao, Peru, and *H.* (as *Buthus*) *hirsutus*, Wood, p. 189, California, *id. l. c.*

Iurus granulatus, C. L. Koch; *id. l. c.* p. 193, Greece and Egypt.

Uroctonus mordax, Thor.; *id. l. c.* p. 196, California, San Francisco.

Pandinus humilis, sp. n., E. Simon, *l. c.* p. 94, Manilla.

Pandinus asper, sp. n., p. 199, locality unknown; *P.* (as *Scorpio*) *africanus*, Linn., p. 202, Africa, = *Heterometrus rasei*, Sim.; and *P.* (as *Buthus*) *megacephalus*, C. L. Koch, p. 203, E. Indies, = *Scorpio indicus* and *S. afer*, Linn., and *S. indus*, De Geer: Thorell, *l. c.*

Palamneus angustimanus, p. 211, sp. n., E. Indies; *P. petersi*, Thor., p. 214, Singapore, E. Indies, = *Heterometrus megacephalus*, Sim.; *P. costimanus*, C. L. Koch, p. 217, Borneo, E. Indies; and *P. levigatus*, sp. n., p. 221, Melbourne, New Holland: *id. l. c.*

Miaphonus wahlbergi, Thor.; *id. l. c.* p. 222, S. Africa.

Opisthophthalmus latro, p. 225, locality unknown, probably S. Africa, *O. lawiceps*, p. 228, *O. prædo*, p. 230, *O. pugnax*, p. 232, *O. curtus*, p. 234,

Caffraria, *O. macer*, p. 236, Cape of Good Hope, *O. fallax*, p. 238, and *O. anderssoni*, p. 239, S. Africa, and *O. histrio*, p. 242, Caffraria, spp. nn., *id. l. c.*

Opisthacanthus validus, p. 243, Caffraria and Cape of Good Hope, and *O. kinbergi*, p. 246, Island St. Joseph, Gulf of Panama, spp. nn., *id. l. c.*

Hormurus caudicula, L. Koch, p. 249, Brisbane, and *H.* (as *Scorpio*) *australasiae*, Fabr., p. 251, Tahiti, Australia, and E. Indies, = *Ischnurus australasiae*, C. L. Koch, *id. l. c.*

Ischnurus taniurus, p. 254, S. Africa, and *I. pectinator*, p. 258, Caffraria, spp. nn., *id. l. c.*

Ioctonus manicatus, Thor., p. 261, New Holland, and *I. orthurus*, sp. n., p. 264, locality unknown, *id. l. c.*

Chactas lepturus, sp. n., *id. l. c.* p. 266, Colombia.

T. Thorell, *l. c.* pp. 162–167, gives a list, with notes, upon some scorpions (types of species described by Degeer) “in Museo Holmiensi.” I. *Scorpio maurus* = *Broteus herbsti*, Thor.; II. *S. flavicaudis* = *Euscorpius flavicaudis*, Degeer; III. *S. indus* = *Pandinus megacephalus*, C. L. Koch; IV. *S. punctatus* = *Isometrus americanus*, Linn.; V. *S. europæus* = *I. americanus*, Linn.; VI. *S. maculatus* = *I. maculatus*, Degeer; VII. *I. testaceus* = *Centrurus testaceus*, Degeer; VIII. *S. australis* = *C. biaculeatus*, Luc.

“*Scorpius flavicaudus*,” Deg.; note by F. Fanzago, Ann. Soc. Mod. x., not seen by the Recorder.

James Wood-Mason, P. E. Soc., 1877, pp. xviii. & xxxiii., has announced the discovery of stridulating organs in *Scorpio afer* and its allies. The organs consist of a “scraper” situated on the flat outer face of the basal joint of the palp-fingers [bulbous portion of digital joint], formed by an oval area of stout, conical, sharp, curved spinules, some of which terminate in a long, limp hair; and a “rasp,” placed on “the flat, produced, inner face of the corresponding joint of the first pair of legs,” and formed by a similar area thickly studded with minute, mushroom-headed tubercles.

PSEUDO-SCORPIONIDÆ.

Chelifer argentinus, sp. n., T. Thorell, Period. Zool. Argent. ii. p. 216, Cordova. *C. alius*, sp. n., J. Leidy, P. Ac. Philad. 1877, p. 261, N. America, attached to an Elaterid beetle, *Alaus oculatus*.

SOLPUGIDEA.

Rhax rostrum-psittaci, sp. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii. p. 225, Gilolo, Moluccas.

PHALANGIIDEA.

GONYLEPTIDÆ.

Pachylus butleri, sp. n., p. 207, San Juan, and *P. granulatus*, C. L. Koch, p. 211, Cordova, T. Thorell, Period. Zool. Argent. ii.

Ostracidium pertyi, sp. n., *id. l. c.*, Cordova.

PHALANGIIDÆ.

Gagrella inermis, p. 95, *G. elegans*, p. 96, pl. iii. fig. 14, and *G. obscura*, p. 96, spp. nn., Eugène Simon, Ann. Soc. Ent. Fr. (5) vii., Manilla.

Mitopus biceps, sp. n., T. Thorell, Bull. U. S. Geol. Surv. iii. p. 525, Colorado.

PYCNOGONIDEA.

G. CAVANNA discusses the skin, and organs of digestion, respiration, circulation, and reproduction, in the *Pycnogonidæ*; he states that the residuum of the food is evacuated by the mouth as well as the vent, and that the egg-bearing pairs of limbs are always present in the male, often really containing eggs, and sometimes more developed than in the female. "Studii e ricerche sui Pycnogonidi;" Firenze: 1877, 19 pp., 2 pls.

P. P. C. HOEK has also observed that in some cases the egg-bearing limbs are present in the males and wanting in the females. In *Nymphon* he has observed a suprapharyngeal and five abdominal ganglions; in *Pycnogonum* only four abdominal ganglions. No heart could be found. Niederl. Arch. Zool. iii. [1876] pp. 235-255, pls. xv. & xvi.

Nymphon hirtum (Fabr. ?) = *hirsutum*, Sabine, = *hirtipes*, Bell, with var. n. *obtusidigitum*, and *stræmi*, Kröyer, Grinnell Land, 82° N. lat.; E. J. Miers, Ann. N. H. (4) xx. pp. 108 & 109 (the new var. figured, pl. iv. fig. 3). *N. gracile*, Leach, from Spitzbergen; *id. op. cit.* xix. p. 140.

Nymphon [-on] *imperfectum*, sp. n. (Chiareghini, MS.); G. D. Nardo, Annotazioni illustranti cinquanta-quattro specie di Crostacei; Mem. Ist. Venet. xiv. [1869] (also separately, 4to, pp. 127, 4 pls.).

Xiphochilus [Bleeker, *Pisces*, 1856], g. n., founded on an old drawing by Chiareghini; for *X. spurius*, sp. n. (Chiareghini, MS.): *id. l. c.* p. 119, pl. iv. fig. 1.

Demophanus, g. n., founded on an old drawing by Chiareghini; for *D. fulsus*, sp. n. (Chiareghini, MS.): *id. l. c.* p. 120, pl. iv. fig. 2, Adriatic. [Probably a *Pycnogonum*, though drawn with only three pairs of feet.]

ACARIDEA.

HOPLOPINI.

Under this name, G. Canestrini & F. Fanzago, Atti Ist. Venet. (5) iii. p. 481, propose the erection of a new family of *Acaridea*, connecting that group with the *Opilionidae*, and for the reception of *Ceculus echinipes*, Duf., the generic name of which is changed to *Hoplopus* (p. 480), as it possesses evident eyes. A general discussion of the animal and its affinities is given, pp. 477-481.

CANESTRINI, G., & FANZAGO, F. Nuovi Acari Italiani. 2a. serie. Atti Soc. Pad. v. [not seen by the Recorder].

KRAMER, P. Grundzüge zur Systematik der Milben. Arch. f. Nat. xliii. pp. 215-247.

The author separates the Mites into two great divisions, *Acarina tra-*

cheata and *A. atracheata*, of which those names are sufficient explanation. To the latter, belong the true *Acaridæ*, also *Glyciphagus*, *Tyroglyphus*, *Rhizoglyphus*, *Dermalichus*, *Myocoptes*, *Listrophorus*, *Histiostoma*, *Phytoptus*, *Demodex*, and the *Sarcoptidæ*. The *Tracheata* are subdivided, according to the position of the two spiracles, into six groups, *Prostigmata*, *Oribatidæ*, *Gamasidæ*, *Ixodidæ*, *Tarsonemida* (for *Dendroptus*, Kramer, = *Tarsonemus*, Canestrini, 1876), and *Myobiidæ*. The *Prostigmata* (also written *Prostigmatia*) comprise, as subfamilies, the *Trombididæ* (*Trombidium* and *Otonia*, g. n., p. 227), *Rhyncholophidæ* (*Rhyncholophus*, *Ritteria*, and *Smaridia*), *Tetranychidæ* (*Tetranychus* and *Bryobia*), *Erythracidæ* (*Erythraeus*), *Rhaphignathidæ* (*Rhaphignathus*), *Tydeidæ* (*Tydeus*), *Megameridæ* (*Scyphius*, *Penthaleus*, and *Eupodes*, ? all = *Megamerus*), *Pachygnathidæ* (*Pachygnathus*), *Hydrachnidæ* (*Hydrachna*), *Hygrobatidæ* (*Sperchon* and *Oreus*, gg. nn., p. 240, also *Diplodontus*, *Arrhenurus*, *Aturus*, *Axona*, *Atax*, *Midea*, *Hydrochoreutes*, *Neswa*, and *Limnesia*), *Eylaidæ* (*Eylais*), *Limnocharidæ* (*Limnocharis*), *Bdellidæ* (*Bdella*, *Scirus*, and *Linopodes*), and *Cheyletidæ* (*Cheyletus* [? rectius *Cheyltus* vel. *Cheleutus*]).

Dendroptus galls are not separable from those of *Phytoptus*; *Rhaphignathus ruberrimus* has decided abdominal segmentation; and observations on the spinning power of *Erythraeus parietinus*: id. l. c. pp. 55 & 53.

ORIBATIDÆ.

Hoplophora ferruginea, C. F. George, Sci. Goss. 1877, p. 205, figs. 162-164, England.

GAMASIDÆ.

Antennophorus, g. n., G. Haller, Arch. f. Nat. xliii. p. 57. For *A. uhlmanni*, sp. n., p. 58, pl. v. figs. 1-5, parasitic on *Formica nigra*.

Gamasus quadripunctatus, Old Calabar, and *G. (?) podager*, no locality mentioned, spp. nn., A. Murray, Economic Entomology [*suprà*, p. 4], p. 161, figs.

Uropoda americana, sp. n., C. V. Riley, P. Am. Ass. xxv. (Buffalo, 1876), 1877, pp. 273-275, fig., with special observation of an extensible penetrating organ, homologous with the maxillæ, and enabling the mite to retain its hold on rupture of the excrementitious connecting anal filament. These appear to be the "Scheerentäster" of Kramer, Arch. f. Nat. xlii. pt. 1.

IXODIDÆ.

Xiphiastor, g. n., Murray, l. c. p. 201. Between *Adenopleura* and *Amblyomma*: "flat, mouth provided with a long projecting rostrum and long palpi applied to it, abdomen with posterior margin beaded." For *X. rostratum*, sp. n., *ibid.* fig., Old Calabar.

Ophiodes [Guenée, *Lepidoptera*, 1841], g. n., *id.* l. c. p. 203. For *Acarus ophiophilus*, Müll., and other snake-mites.

Argas moubata, sp. n., *id.* l. c. p. 182, fig., Angola.

Ixodes brevipes, Ceylon, and *distipes*, Tunis [names only], spp. nn., *id. l. c.* p. 191.

Amblyomma pacificum, sp. n., *id. l. c.* p. 203, Sandwich Isles.

Argas fischeri, sp. n., C. F. George, J. Quek. Club, No. 33, Feb. 1877, and Sci. Gos. 1877, p. 104, figs. 85-87, Lincolnshire; = *A. pipistrellæ*, Aud., *teste* J. O. Westwood, P. E. Soc. 1877, p. lxii.

HALACARIDÆ.

This new family suggested for the marine mites, and, though placed between the *Ixodidæ* and *Oribatidæ*, considered rather as a link between the *Bdellidæ* or *Trombididæ* and the *Oribatidæ*. A. Murray, *l. c.* p. 205.

TROMBIDIIDÆ.

A. L. DONNADIEU's "Recherches pour servir à l'histoire des Tétranyques," referred to in Zool. Rec. xii. p. 260, is also published in Ann. Soc. Linn. Lyon (n.s.) xxii. [for 1875, published in 1876], pp. 29-180, pls. i.-xii. After a general, historical, and anatomical treatment of his subject, the author divides his family "Tétranycoïdés" into four tribes: 1, "Tétranyques erratils," for *Tenuipalpus*, g. n., p. 139, comprising *T. palmatus* (? *Trombidium caudatum*, Serv., ? *Tetr. caudatus*, Dug.), *T. spinosus* and *glaber* (*Tromb. glabrum*, Dug.), and *Brevipalpus*, g. n., p. 143, comprising *B. obovatus* (*Tromb. lapidum*, Herm.), and *B. pereger*. 2, "Tétranyques tisserands," for *Distigmatus*, g. n., p. 146, founded on *D. pilosus* (*Tetranychus linearius*, Duf.), and *Tetranychus*, Duf., comprising *T. major*, Dug., *piger* (*urticæ* and *ulmi*, Koch), *minor* (*Tromb. socium*, Herm., pt.), *longitarsis* (*Tr. socium*, pt., and *tenuipes*, Herm.), *plumistoma* (*Tr. socium*, Herm., pt.), *telarius*, L., and *rubescens* (*Tetr. cristatus*, Dug., *Tr. lapidum*, Herm.). 3, "Tétranyques gallacares," for *Phytocoptes* (Thomas, as larva), comprising *P. epidermi* (*Typhlodromus pyri*, Scheuten), *gallarum* (*Flexipalpus tilie*, Sch.), and *nervorum*. All these are figured, with details.

MÉGNIN, P. Mémoire sur les Métamorphoses des Acariens en général, et en particulier sur celles des Trombidions. Ann. Sci. Nat. (6) iii. Art. No. 5 [1876], pp. 1-20, pls. xi. & xii. [*cf.* Zool. Rec. xiii. *Arachn.* p. 19].

Trombidium phalangii, Dugès, is a "nymph" of *T. fuliginosum*, Herm.; *Leptus autumnalis* is the larva of *T. holosericeum*; their transformations and anatomy described and figured.

Petrobia, g. n., A. Murray, Econ. Ent. Apt. p. 118. Differs from *Bryobia* in having three eyes in the posterior angles of cephalothorax, and the abdomen without triangular marginal papillæ. Type, *Trombidium lapidum*, Herm.

Rhaphignathus spinifrons, p. 25, pl. iii. figs. 2-5, Northumberland, and *R. hispidus*, p. 25, figs. 1-3, Durham, spp. nn., G. S. Brady, P. Z. S. 1877.

Trombidium causing pruritus in the human subject; T. Fox ("Medical Examiner," Dec. 21, 1876), P. E. Soc. 1877, p. ii.

Trombidium fuscum, Brady. Name changed from *fucicolum* on its having been found in Ireland and England in fresh water. Brady, *l. c.* p. 26. [Scarcely seems a good reason for change of name.]

Pachygnathus nigrescens, sp. n., *id. l. c.* p. 26, pl. iv. figs. 4 & 5, Northumberland.

Tetranychus. "La bocca ed i piedi dei *Tetranychus*." Errors in descriptions of former authors (Dugès, Claparède, Donnadieu, &c.) pointed out, and claws and mouth parts explained. A. Targioni-Tozzetti, Bull. Ent. Ital. ix. pp. 333-340, pl. viii. figs. 4-9.

Tetranychus eriostemi, sp. n., A. Murray, *l. c.* p. 109, fig., on *Eriostemon nerifolium*, London.

ACARIDÆ.

MÉGNIN, J. P. Monographie de la Tribu des Sarcoptides Psoriques, qui comprend tous les Acariens de la gale de l'Homme et des Animaux. R. Z. (3) v. pp. 46-213, pls. iv.-viii.

This important addition to medical Arachnology is divided into the following parts:—(1) Historical, commencing with the Scriptures, but containing many useful references. (2) Natural history of the *Acaridea*, constituting the tribe of "Sarcoptides psoriques." In this, the author proposes the following classification for the *Acaridea*: *Gamasidae*, *Iarodidae*, *Oribatidae*, *Sarcoptidae*, *Myobiidae*, *Seiridae*, *Trombidiidae*, *Limnochariidae*, *Hydrachnidae*, *Atcidae*, *Arctisconidae*, and *Demodicidae*. These families are subdivided into tribes, the *Sarcoptidae* being composed of *Detriticoles*, *Psoriques*, *Avicoles*, and *Gliricoles*; and the *Psoriques* consist of the genera *Sarcoptes*, *Psoroptes*, and *Chorioptes*. Full descriptions, with synonymy and biology, are given of *Sarcoptes scabiei*, L., which is common to man and a large number of animals, with varr. *suis*, p. 83, *equi*, p. 84, pls. iv. & v., *vulpis* and *lupi*, p. 86, *capre*, p. 88, *cameli*, p. 89, *ovis*, p. 90, *hydrochæri*, p. 91, and *hominis*, p. 92; *S. notoedres*, Bourg. & Delaf., pl. iii. (= *cati*, Héring, 1838), with varr. *muris*, p. 114, and *cati*, p. 115; *S. mutans*, Rob., pl. vii.; *Psoroptes longirostris*, sp. n., p. 138 (= *Sarcoptes equi*, Hér., *Dermatodectes communis*, Bourg. & Del.), with varr. *equi*, pl. viii., and *bovis*, p. 140, *cuniculi*, p. 141, and *ovis*, p. 142; *Chorioptes* (= *Symbiotes*, Gerlach, *nec* Redt., *Col.*; = *Dermatophagus*, Fürstenb.) *spathiferus*, sp. n., p. 154 (= *bovis* or *equi*, Gerl.), with var. *equi*; *C. setiferus*, sp. n., p. 147, with varr. *hyenæ*, *ibid.*, and *vulpis*, p. 158; *C. ecaudatus*, sp. n., p. 158 (? = *Sarcoptes cynotis*, Hér.), with var. *catotis*, p. 160. (3) Organization and physiology of the itch-mites.

GUZZONI, MELCHIORRE. Sull Acariasi del condotto uditivo esterno. Milan: 1877 [not seen by the Recorder, but quoted by Mégnin, Mon. Sarc. Psor. pp. 154 & 213, with reference to *Acari* in the auditory meatus of the dog and pig].

Analges, Nitzsch (= *Dermalichus*, Koch). Revision of the genus by G. Haller, Z. wiss. Zool. xxx. pp. 50-80, pl. iii. Thirteen species are recognized, including *A. nitzschi*, p. 70, fig. 12, on *Emberiza citrinella*, *A. coleopteroides*, p. 74, fig. 14, also on that bird, *A. affinis*, p. 75, fig. 15, on

Trichodroma phænicoptera, and *A. certhiæ*, p. 76, fig. 16, on *Certhia familiaris*, spp. nn. Full biological and anatomical particulars are given.

Freyana, g. n., *id. l. c.* p. 81, pl. iv. figs. 5-13. For *Dermalichus anatinus*, Koch.

Picobia, g. n., *id. l. c.* p. 91, pl. iv. figs. 1-4. Near *Myobia*. For *P. heeri*, sp. n., *id. l. c.* p. 93, on *Gecinus canus*.

Labidophorus, g. n., P. Kramer, Arch. f. Nat. xliii. p. 249. For *L. talpæ*, sp. n., *l. c.* pp. 248-253, pl. xvi. figs. 1-3, on *Talpa europæa*.

Pygmephorus, g. n., *id. l. c.* p. 254, for *P. spinosus*, sp. n., *l. c.* pp. 254-258, pl. xvi. figs. 4-10, also on the mole.

The following subfamilies proposed: (1) *Hypoderides*, *Hypopides*, *Tyroglyphides*, (2) *Sarcoptides*, *Phytoptides*; A. Murray, Economic Entomology, *Aptera*, p. 227.

Schistosoma, g. n., very near *Sarcoptes*. For *S. longisetum*, sp. n., G. S. Brady, *l. c.* p. 27, pl. iii. fig. 1, Peterhead, Scotland.

F. A. W. THOMAS, Nova Acta L.-C. Ak. Naturf. xxxviii. [1876], pp. 255-288, pls. ix.-xi., describes and figures various vegetable deformities caused by *Phytoptus*, under the name of "Acaroceciden," without, however, in any way describing or identifying the causers of the growths. See also Z. ges. Naturw. xlvii. [1876] pp. 280 & 281.

The same author, in "Aeltere und neue Beobachtungen über Phytoptociden," Z. ges. Naturw. xlviii. pp. 329-388, pl. vi., gives a list of 25 plants on which these galls have been observed.

Phytoptus vitis. Economy described at full length; G. Briosi, Journal de Micrographie, i. p. 69 (also in R. Z. 3, vi. pp. 240-248: = *Phytoptes epidermi*, larva; J. Pelletan, *l. c.* p. 240, note).

MYRIOPODA.

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S.

FANZAGO, F. Sopra alcuni Miriapodi cavernicoli della Francia e della Spagna. Atti Acc. Rom. (3) Mem. i. pp. 407-417.

After a general discussion of the French and Spanish cave-dwelling Myriapods, the author describes *Craspedosoma simoni*, sp. n., p. 410, Spain and Basses Alpes, *Strongylosoma bisulcatum*, sp. n., p. 411, Ardèche, *Polydesmus subterraneus*, Heller, *P. cavernarum*, Peters, *Blaniulus gutturalis*, F. (with synonymy), *Lithobius* (*Archilithobius*) *cavernicolus* [-la] and *L. speluncarum*, spp. nn., p. 414, Ariège, *L. pleonops*, Menge, *Geophilus* [script. *Geofilus*] *flavus*, Deg., and *Polyxenus lagurus*, L.

H. WEYENBERGH, in R. Napp's "Die Argentinische Republik" (Buenos Aires: 1876, 8vo), p. 185, records *Myriopoda* from La Plata.

F. W. HUTTON, Ann. N. H. (4) xx. pp. 114-117, describes the following spp. nn. from New Zealand:—

Hemicops impressus, p. 114, Dunedin and Queenstown.

Himantarium ferrugineum, Wellington and Otago, and *H. morbosum*, Wellington and Dunedin, p. 115.

Iulus (*Spirostreptus*) *strictus*, p. 115, Dunedin.

Polydesmus (*Oxyurus*) *serratus*, p. 115, Dunedin, *P. worthingtoni*, p. 116, Queenstown, and *P.* (*Strongylosoma*) *macrocephalus*, p. 116, Dunedin.

Craspedosoma tri-setosum, p. 116, Dunedin.

Spherotherium liosomum, p. 116, Dunedin.

Iulus nitens, sp. n., A. Murray, Economic Entomology, *Aptera*, p. 18, fig., ? East Indies.

Polydesmus dorsalis, sp. n, *id. l. c.* p. 20, fig., "tropical."

Brachycybe rosea, sp. n., *id. l. c.* p. 21, fig., California.

Scolopendra angusticollis, Old Calabar, and *cæruleo-viridis*, Australia, spp. nn., Murray, *l. c.* p. 27.

Heterostoma browni, sp. n., A. G. Butler, P. Z. S. 1877, p. 282, fig., Duke of York Island.

Spirobolus cinctipes, sp. n., *id. l. c.* p. 283, Duke of York Island.

Polyxenus lagurus, Deg.; J. Bode, Z. ges. Naturw. 1. pp. 231-268, pls. xi.-xiv., contributes an elaborate discussion of its anatomy, morphology, and development.

PERIPATUS.

Of the various positions given to this form, that suggested by Gegenbaur (Grundriss Anat., 2nd ed. 1877) is probably the most satisfactory; he regards them as *Protracheata*, a group of *Arthropoda* equivalent to the *Branchiata* on the one hand, and the *Tracheata* on the other.

Hutton's statements (Ann. N. H. 4, xviii. pp. 361-369, pl. xvii.) [1876] were made with an incomplete knowledge of Moseley's original paper; he notes the ejection of viscid fluid for purposes of offence, and believes he has evidence of moulting, and that breeding occurs all the year round. His observation of hermaphroditism is declared by Moseley (Ann. N. H. 4, xix. pp. 85-91) to be due to a misapprehension; in answer to which Hutton (*op. cit.* xx. pp. 81-83) re-affirms the existence of hermaphrodite, though allowing the existence of male, forms.

INSECTA.

THE GENERAL SUBJECT.

BY E. C. RYE, F.Z.S., M.E.S.

BERTKAU, P. Bericht über die wissenschaftlichen Leistungen auf dem Gebiete der Arthropoden während der Jahre 1875 und 1876 (Zweite Hälfte). Arch. f. Nat. xliii. (2) pp. 221-396.

Refers to all orders but *Coleoptera*.

GANIN, M. [Materials for a Knowledge of the Post-embryonal Development of Insects]. Warsaw: 1876, 4to, pp. 76, 4 pls.

Extracted from the Transactions of the fifth meeting of Russian Naturalists in Warsaw; Section of Zoology and Comparative Anatomy. Noticed at some length, with translation of the author's conclusions, in Am. Nat. xi. pp. 423-430. The "conclusions" occupy four closely-printed 8vo pages, and admit of no abstract—so skilled a morphologist as Dr. Packard even abstaining from anything but reproduction of them.

GOSS, H. The Insect Fauna of the Recent and Tertiary Periods. London: 1877, 8vo, pp. 65.

The first of three proposed papers on fossil Insects, and the British and foreign formations in which insect-remains have been detected, reprinted from the Proceedings of the Geologists' Association, v. (No. 6). A useful collection of scattered references, with critical and other comments, followed by lists of the insect-remains discovered in formations of the post-tertiary and tertiary periods, arranged by strata.

GRABER, VITUS. Die Insekten. I. Theil; Der Organismus der Insekten. München: 1877, sm. 8vo, pp. 403, 200 woodcuts.

Originally published in "Die Naturkräfte," vol. xxi. The comparative and special anatomy and physiology of Insects is discussed in twelve chapters. The second part, "Vergleichende Lebens- und Entwicklungsgeschichte der Insekten" has also appeared in "Naturkräfte," vol. xxii.

MÜLLER, H. Fertilization of Flowers by Insects. Nature, xv. pp. 317-319, 473-475, figs. 94-115, xvi. p. 265, & pp. 507-509, figs. 116-130.

Refer to *Gentiana* and *Salvia*. See also letter from Fritz Müller, with introduction by C. Darwin, *op. cit.* xvii. p. 78; also T. MEEHAN, *infra*, p. 5.

1877. [VOL. XIV.]

MURRAY, A. Economic Entomology. Aptera. London (no date): 8vo, pp. 433, woodcuts.

The first of a proposed series of "South Kensington Museum Science Handbooks, Branch Museum, Bethnal Green," primarily intended as guides to the different branches of the collection of Economic Entomology in course of formation at that branch. The mechanical exigencies of the exhibition appear to have caused the author to revert to the use of the long abandoned division of *Aptera*, which, as here exemplified, includes *Crustacea* likely to be mistaken for insects, *Myriopoda*, *Arachnida* (in the widest sense), *Anoplura* (both *Mallophaga* and *Pediculidae*), and *Thysanura*,—all these being classed as *Insecta*. Any pretension to Systematic Entomology is repudiated by the author, who, nevertheless, has not hesitated to found a family, sub-family, three genera, and thirteen species as new. The work, in spite of the above-mentioned faults, is a useful compilation of scattered descriptions, with many original observations, and contains figures, chiefly from good authorities, of most of the species noticed.

PALMÉN, J. A. Zur Morphologie des Tracheensystems. Helsingfors: 1877, 8vo, pp. i.-x. 1-149, pls. i. & ii.

After a general discussion of the morphology of the *Tracheata*, including the question as to which of the two chief types, the open or stigmal and the closed or gill systems, is the more primitive (inclining to the latter), and special observation on the want of direct evidence as to the method in which the closed system of the larvæ of *Ephemeridæ*, &c., becomes a stigmal system in the perfect insect, the author devotes considerable attention to the *Neuroptera*, with the ultimate opinion that no genetic relation exists between the tracheal-gills and stigmata. The respiratory organs in *Diptera*, *Hymenoptera*, *Lepidoptera*, and *Coleoptera* are then discussed, so far as known, with a result (apparently only logically derived from the *Diptera*) exactly similar. The tracheal-gills, in fact, never correspond in position precisely with the future stigmata; and the persistence of the gills in the imago, heretofore considered as an individual malformation, or an anomalous and very restricted condition, is asserted to be normal in all gill-bearing *Perlidae* and *Æschnidæ*, in many and probably all similar *Neuroptera*, and presumably also in the small gill-bearing *Lepidoptera* and *Coleoptera*. The gills are, however, shed in the *Ephemeridæ*, *Agrionidæ*, and *Diptera*. The stigmata are upon metamorphosis opened by means of ten pairs of thin threads, which connect the closed tracheal system with the side of the body. These threads are believed to exist in the larva, but not to be developed, remaining as rudimentary tracheal-branches, and certainly representing the missing stigmata.

PERRIS, É. Rectifications et additions à mes Promenades entomologiques. Ann. Soc. Ent. Fr. (5) vii. pp. 379-386.

Supplementary to the paper noticed in Zool. Rec. xiii. *Ins.* p. 3.

PLATEAU, F. Note additionnelle au Mémoire sur les phénomènes de la digestion chez les Insectes. Bull. Ac. Belg. (2) xlv. pp. 710-733.

From a series of specified observations on *Coleoptera*, *Neuroptera*,

Orthoptera, *Diptera*, *Hymenoptera*, and *Lepidoptera*, including carnivorous and herbivorous species, the author modifies his former opinion (Mém. Ac. Belg. xli.; Zool. Rec. xi. p. 242) that in a normal condition the digestive juices of all insects are alkaline or neutral, and never acid. He now admits a slight acidity in the carnivorous and polyphagous species, but adheres to the alkaline nature of the fluids in perhaps all of the vegetable feeders. In these latter, the natural acidity in their pabulum is either neutralized in the alimentary canal or yields to an alkaline reaction during digestion; though a certain degree of acidity reappears in the excreta, probably owing to partial decomposition.

— L'instinct des Insectes peut-il être mis en défaut par des fleurs artificielles? [Association Française pour l'avancement des Sciences. Congrès de Clermont-Ferrand, 1876]. Paris: [n. d.], 8vo, pp. 1-6.

The author records the want of result in attracting *Vanessa urticae*, *Apis*, *Eristalis*, *Anthophora*, *Bombus*, *Pieris*, *Trichius*, *Syrphus*, &c., by means of artificial flowers.

RILEY, C. V. Ninth Annual Report on the noxious, beneficial, and other Insects of the State of Missouri, &c. Jefferson City, Mo.: 1877, 8vo, pp. i.-vii., 1-111, 33 woodcuts, maps.

A practical discussion of the habits, &c., of *Eufitchia ribearia*, Fitch, *Nematus ventricosus*, *Pristiphora grossulariae*, Walsh, *Emphytus maculatus*, Norton, *Lophyrus abboti*, Leach, *L. lecontii*, Fitch, *Doryphora 10-lineata* (with a new Acarideous parasite, *Uropoda americana*, p. 41, fig. 13), *Leucania unipuncta* and *albilinea*, and *Caloptenus spretus*; also *Corydalis cornutus* and *Megathymus yuccæ*.

RONDANI, C. Repertorio degli Insetti parassiti e delle loro Vittime. Bull. Ent. Ital. ix. pp. 55-66.

Continues the supplement to the first part, enumerating Dipterous, Coleopterous, Hemipterous, and Acarideous parasites, alphabetically arranged, with brief observations upon the other insects attacked by them. In the *Diptera*, *Anthrax palumbii*, *Leucopis ampelophila* [sic], and *Tachina* ? *doryphoræ*; in the *Coleoptera*, *Coccinella doryphorina*; in the *Hemiptera*, *Harpactor solanophilus*; and in the *Acaridea*, *Acarus* ? *planchoni*, are referred to as "interim" new species, but not described.

ROTHSCHILD, — Les Insectes: Organisation, Mœurs, Chasse, Collections, Classification. Paris: 1877, 4to, 24 pls., 450 woodcuts.

Includes all orders but *Coleoptera* and *Lepidoptera*. [Not seen by Recorder.]

SCUDDER, S. H. The first discovered traces of fossil insects in the American Tertiaries. Bull. U. S. Geol. Surv. iii. pp. 741-762.

Descriptions of insect-remains found upwards of ten years ago by Prof. Wm. Denton in the Tertiary beds of the Lower White river, partly in Utah and partly in Colorado. The *Coleoptera* were described in vol. i. of the same publication. The following new genera and species are now described:—*Hymenoptera*: *Camponotus vetus* and *Liomelopus pingue*, p. 742, *Ichneumon petrinus*, p. 743. *Diptera*: *Culex proavitus*, *Corethra exita*, *Chironomus depletus* and *patens*, p. 744, *Lasiptera recessa*, p. 745,

Lithomyza (g. n., *Cecidomyiidae*) *condita*, p. 746, *Dicranomyia strigosa*, *ibid.*, *D. primitiva*, p. 748, *D. rostrata*, p. 749, *Spiladomyia* (g. n., *Tipulidae*) *simplex*, p. 750, *Pronophlebia* (g. n., *Tip.*) *rediviva*, *ibid.*, *Cyttaromyia* (g. n., *Tip.*) *fenestrata*, p. 751, *Tipula decrepita* and *tecta*, p. 752, *Mycetophila occultata*, p. 753, *Sackenia* (g. n., *Mycetophilidae*) *arcuata*, p. 754, *Gnoriste dentoni*, p. 755, *Acrocera hirsuta*, p. 755, *Eristalis lapideus*, p. 756, *Musca ascarides*, *ibid.*, *M. bibosa* and *hydropica*, p. 757, *M. vinculata*, p. 758, *Heteromyza detecta*, *ibid.* *Rhynchota*: *Aphana atava*, p. 759, *Delphax senilis*, p. 760, *Tettigonia oblecta*, *Bythoscopus lapidescens* and *Pachymerus pratensis*, p. 761. *Neuroptera*: *Phryganea operta*, p. 762.

SCUDDER, S. A. The Insects of the Tertiary Beds at Quesnel. Appendix to Mr. George M. Dawson's Report, in Selwyn's Geol. Survey of Canada, Rep. of Progress for 1875-76 (Ottawa: 1877, 8vo), pp. 266-280.

The beds where these were found are at Quesnel Mouth, British Columbia, 122° 30' W. longitude. *Coleoptera* were almost entirely absent, and the *Diptera* seemed very different in facies from those of any other known locality. The following are described, mostly from fragments:—*Hymenoptera*: *Formica arcana*, p. 266, *Hypoclinia oblitterata* and *Aphanogaster longava*, p. 267, *Pimpla saeva*, p. 268, *decessa*, p. 269, *Calypstites*, g. n. (*Braconidae*, differing from *Calypsus* in neurulation), for *C. antediluvianum*, p. 270. *Diptera*: *Boletina sepulta*, p. 271, *Brachypeza abita*, *ibid.*, *procera*, p. 272, *Trichonta dawsoni*, *ibid.*, *Anthomyia inanimata*, p. 273, *burgessi*, p. 274, *Heteromyza senilis* and *Sciomyza revelata*, p. 275, *Lithortalis*, g. n. (*Ortaliidae*, allied to *Ceratopsys*), p. 276, for *L. picta*, p. 277, *Lonchæa senescens*, p. 277, *Palloptera morticina* ["an indistinguishable crushed mass of chitine, and the basal half or more of a single wing, are all that remain of this creature"], p. 278. *Coleoptera*: *Prometopia depilis*, p. 278. *Hemiptera* (*Homoptera*): *Lachnus petrorum*, p. 279. A fragment of a Neuropterous insect, and various other fragments are referred to.

UHLER, P. H. Report upon the Insects collected by P. R. Uhler during the Explorations of 1875, including Monographs of the Families *Cydnidae* and *Saldae*, and the *Hemiptera* collected by A. S. Packard, jun., M.D. Rep. U. S. Geol. Surv. iii. pp. 355-475, 765-801, pls. xxvii. & xxviii.

The author's experiences were on the plains and mountains of Eastern Colorado, with Denver as a centre. After some general remarks upon the distribution and habits (especially as to similarity in colour, &c., to places or objects frequented) of insects of all orders met with, he gives a special descriptive account of the *Rhynchota* (to which the indifferent plates refer), followed by lists, with localities, of the *Lepidoptera*, *Coleoptera*, *Diptera*, *Hymenoptera*, *Neuroptera*, and *Orthoptera*. In an appendix, A. R. Grote describes some of the *Lepidoptera*. The parts of Eastern Colorado within reach of irrigation are considered as capable of being made the greatest honey-producing locality of the Continent.

Insects in amber (2 *Coleoptera*, 1 *Hymenoptera*, new); J. P. E. F. Stein, MT. Münch. ent. Ver. i. pp. 28-30.

Ovology. Pérez's paper, "Ovologie des insectes, sur les cellules dites vitellogènes," read at the 1877 meeting of the Réunion des Sociétés savantes des départements," is abstracted in Pet. Nouv. ii. p. 125. A. Brandt's paper, "Études comparatives sur les tubes ovifères et l'œuf des Insectes," Bull. Sci. Nat. Mosc. 1876, has not been seen by the Recorder.

An abstract of H. Grenacher's paper on the eyes of Arthropods, by B. T. Lowne, Ent. x. pp. 181-183, 193-198.

On hearing in insects; H. Cocil, Nature, xvii. p. 102. On a special organ; A. H. Swinton, Ent. M. M. xiv. p. 121.

Use of antennæ in insects. L. Trouvelot, Am. Nat. xi. pp. 193-196, from experiments on *Lepidoptera* and ants, considers these organs to be the seat of an unknown sense, "a kind of feeling or smelling at a great distance." A. S. Packard, jun., *tom. cit.* pp. 418-423, from similar but more widely extended experiments, concludes that nothing is proved except an indication that the insect's brain is as it were projected into the antennæ, the nerves of which probably possess nucleated cells, homologous with those of the ganglia from which the sense-nerves originate.

Digestion in Insects. An analysis of Jousset de Bellesme's conclusions; G. Levassort, Feuil. Nat. vii. pp. 72 & 73, 83-85, 99-102 (*cf.* PLATEAU, *suprà*).

Vitality of Insects. A. S. Packard, jun., records experiments (mostly decapitation) on a few insects of different orders; an *Agrotis* survived decapitation till the fifth day: Psyche, ii. pp. 17-19. The severed abdomen of *Vespa germanica* stinging for 32 hours and moving for 42 hours; C. Haury, Pet. Nouv. ii. p. 179. See also *Formicidæ* [*Hymenoptera*, *infra*]; and, on vitality after immersion in alcohol, P. Billiet, Feuil. Nat. vii. p. 94.

G. Dimmock, Psyche, ii. pp. 19-22, records the effect of a few common gases on Arthropods. Carbonic dioxide, alone or mixed with air, is poisonous to insects; oxygen seems only to stimulate them, though sometimes producing death; nitric oxide is a quick poison.

On insect-bites and stings; L. Provancher, Nat. Canad. ix. p. 277.

Hybernation; G. de Rossi, Ent. Nachr. iii. p. 110.

Insects in coal pits; H. Vaughan, Ent. M. M. xiv. p. 141.

On the causes of "assembling" among insects; B. P. Mann, Psyche, ii. p. 39.

On swarming; F. Rudow, Ent. Nachr. iii. p. 158.

Mimicry. Neville Goodman, P. Cambridge Phil. Soc. iii. pt. 2, describes a striking instance, a *Laphria* reproducing the appearance and habits of *Vespa orientalis* (P. E. Soc. 1877, p. xxxiii.). All colours concerned in mimicry are hypodermic; Hagen, Psyche, ii. p. 23.

Selective discrimination in insects; Nature, xvi. p. 522, xvii. pp. 11, (H. O. Forbes) 62, (J. B. Bridgman) 102, (F. M. Burton) 162 & 163.

T. Meehan, P. Am. Ass. xxiv. (Detroit: 1875), 1876, p. 243, argues, 1, that the great bulk of coloured flowering plants are self-fertilizers; 2, that only to a limited extent do insects aid fertilization; 3, that self-fertilizers are in every way as healthy and vigorous, and immensely more

productive than those dependent on insect aid; 4, that where plants are dependent on insects, they are the worse fitted to engage in the struggle for life.

Kerner's "Schutzmittel der Blüthen gegen unberufene Gäste" (Wien: 1876) has not been seen by the Recorder.

Insectivorous plants. Additions to the list; W. J. Beal, P. Am. Ass. xxiv. (Detroit: 1875) 1876, p. 251. C. Cramer, "Ueber die Insectenfressenden Pflanzen" (Zürich: 1877), gives an epitome of all hitherto recorded on this subject. A figure of *Drosera* with moth entangled; W. Wilson, Nature, xvi. p. 362.

Injurious Insects. On the method of subduing them; J. L. Leconte, P. Am. Ass. xxiv. (Detroit: 1875) 1876, p. 202. Report of Conference at Society of Arts on means of destruction in England; Nature, xvi. p. 104. On extirpation; A. Murray, J. Soc. Arts, xxv. p. 734. Notes of observations during 1877, by E. A. Ormerod, T. A. Preston, and E. A. Fitch, in an 8vo pamphlet, with cuts, printed for gratuitous distribution.

Insects injurious to the vine; J. Lichtenstein, Feuil. Nat. viii. p. 21. To rice; A. Bertoloni, "Sui Malanni e sugli Insetti nocivi al riso nel Bolognese" (Bologna: 1876).

Plant-galls in Scotland; W. H. Trail, Scot. Nat. iv. pp. 13-18.

The "Bulletin d'Isectologie agricole" (not seen by the Recorder) appears, from the notices in Bibliographical portion of Bull. Soc. Ent. Fr. (5) vii., to contain many economic notices. A great number of small economic and other notices are also contained in the "Scientific American," vols. xxxii.-xxxvi., and recorded in Psyche, ii. pp. 94-96 [for 1877, not published until 1878].

General observations, extending from 1871-1876; K. von Dalla Torre, Ent. Nachr. ii. pp. 33-37, 117-119.

Indications of geographical changes afforded by the distribution of insects; J. L. Leconte, P. Am. Ass. xxiv. (Detroit: 1875), 1876, p. 4.

Netherlands. Various observations on scattered species, in Tijdschr. Ent. xx. Verslag, with special lists of insects taken at Walcheren, &c., pp. xxvii.-xxxv. For *Coleoptera*, see also Everts, infra [*Coleoptera*, titles].

Moravia, Austrian Silesia, and Freistadt, Upper Austria. Dates of appearances of insects registered; Verh. Ver. Brünn, xv. pp. 162-164.

Szamosfalva, near Clausenbourg. *Coleoptera* and *Hemiptera* found in salterns; G. v. Horvath, Torm. füzetek, 1877, p. 94.

Küstai. Notes on Alpine insect-fauna; K. von Dalla Torre, Ent. Nachr. iii. p. 169.

Navacerrada, near Madrid. Perez Arcas, Act. Soc. Esp. vi. pp. 54-61.

Egypt and Syria. W. D. Robinson-Douglas, Ent. M. M. xiv. p. 135.

West Siberia. Insects observed during Dr. O. Finsch's expedition of 1876 referred to in the "Catalog der Ausstellung ethnographischer und naturwissenschaftlicher Sammlungen" (Bremen: 1877, 8vo, published by the Geographical Society of that town), p. 24. *Lepidoptera* from N.W. Altai, *Coleoptera* from the Kirghese Steppes, Altai, and River Ob, *Hymenoptera* from the two latter localities and honey from the Altai

and Ala-Tau, *Diptera* from the Ob and Tundras, and some *Neuroptera* and *Orthoptera*, are mentioned.

The Yenissei. Insects of Nordenskiöld's Expedition; J. Sahlberg, *Deutsche E. Z.* 1877, p. 270; P. E. Soc. 1877, p. iv. See also Mäklin, *Coleoptera*, *infra*.

Nares's Arctic Expedition. Observations on the *Insecta*; R. McLachlan, *Ent. M. M.* xiii. p. 181; *op. cit.* xiv. p. 167; P. E. Soc. 1877, p. xxv.

American 'Polaris' Expedition. Observations on the *Insecta* (a new species of *Microgaster* and another of *Isotoma* described in note); A. S. Packard, *Am. Nat.* xi. p. 51; R. McLachlan, *Ent. M. M.* xiii. p. 229.

Quebec. Insects observed at Cap Rouge in 1877; L. Provancher, *Nat. Canad.* ix. pp. 349-352.

Western N. America. C. R. Osten Sacken, *Bull. U. S. Geol. Surv.* iii. pp. 349-354, in some remarks on the *Diptera* of California, discusses in a general way the distribution of the *Insecta* in the N.W. States. The Rocky Mountains do not form a natural boundary for a distinct entomological fauna. The real dividing point is the line (somewhere about long. 98°) of summer dryness, where agriculture becomes precarious without artificial irrigation. Northwards, this region extends until circumpolar forms occur; southwards, until a tropical fauna commences. The author's observations bearing on the analogies of the Western American fauna with those of Europe and Asia, and on other connected points, deserve careful attention.

West Indies. Notes on insects attacking cocoa-nut trees; A. W. B. Grevelink (*in litt.*), P. E. Soc. 1877, pp. xix.-xxii.

La Plata. The *Insecta* discussed by H. Weyenbergh, in R. Napp's "Die Argentinische Republik" (Buenos Aires: 1876, 8vo), pp. 172-184.

Chili. Note on insect fauna, especially on the occurrence of palæarctic and nearctic forms; R. McLachlan, *Nature*, xvii. p. 162 [*cf.* A. R. Wallace, *tom. cit.* p. 182].

New Ireland. W. Macleay, P. Linn. Soc. N. S. W. i. pp. 301-306.

Sandwich Isles. T. Blackburn, *Ent. M. M.* xiii. p. 227.

Indoor collecting; Fettig, *Pet. Nouv.* ii. p. 190.

Nitrate of amyle for killing specimens; C. Emery, *Pet. Nouv.* ii. p. 133.

Insects in museums affected by larvæ of *Dermestidae*, freed from their destroyers by cyanide of potassium and sulphuric acid; J. T. Bell, *Canad. Ent.* ix. p. 139.

Collections. On the advantage of indicative notes; A. Constant, *Pet. Nouv.* ii. p. 102; *cf.* also pp. 110, 118, 127, & 134. Educational collections; S. J. Capper, *Ent.* x. p. 40.

Berlin University Entomological Museum. Criticisms on the management; G. Kraatz, *Deutsche E. Z.* 1877, p. 265.

Dublin Society Collections; W. F. Kirby, *Ent. M. M.* xiii. p. 283.

Note on sale of Mr. Edwin Brown's collections; *Ent. M. M.* xiii. p. 257.

Sahlberg's works analyzed; Schinidt-Gübel, *S. E. Z.* xxxviii. p. 381.

Analysis of Costa's "Ricerche entomologiche" (Napoli: 1858); L. v. Heyden, *Deutsche E. Z.* 1877, pp. 423-428.

Annual Report of the Entomological Society of the Province of Ontario for the year 1876. Toronto: 1877, 8vo, pp. 58.

Criticisms on *Trans. Ent. Soc.* 1876; J. W. Dunning, *Ent. M. M.* xiii. p. 259.

Kiesenwetter, *Deutsche E. Z.* 1877, pp. 193-202, reports the entomological transactions of the 49th "Versammlung deutscher Naturforscher und Aertze" in Hamburg, Sept., 1876.

Classification. In F. P. Pascoe's "Zoological Classification" (London: 1877, 18mo, pp. 204; reviewed, *Ent. M. M.* xiii. p. 258, *Pet. Nouv.* ii. p. 124), the *Insecta* form part of the *Arthropoda (Articulata)*, and are divided into eleven orders: *Mallophaga*, *Collembola*, *Thysanura*, *Hemiptera*, *Orthoptera*, *Neuroptera*, *Trichoptera*, *Diptera*, *Lepidoptera*, *Hymenoptera*, and *Coleoptera*.

COLEOPTERA.

BY

E. C. RYE, F.Z.S., M.E.S.

THE GENERAL SUBJECT.

BATES, H. W. On the *Coleoptera* collected by the Rev. G. Brown, C.M.Z.S., on Duke of York Island, New Ireland, and New Britain. *P. Z. S.* 1877, pp. 151-159, pls. xxiv. & xxv.

The collection, which is evidently the result of very superficial work, tends to prove an identity of the fauna with that of New Guinea.

BELING, T. Beitrag zur Metamorphose der Käfer. *Arch. f. Nat.* xliii. pp. 41-54.

Describes the larvæ and pupæ of *Chlenius vestitus*, *Amara familiaris*, *Xantholinus lentus*, *Acidota crenata*, *Elodes livida*, *Eros affinis*, and *Eros aurora*.

BERTOLONI, G. Descrizione di 4 specie nuove di Coleotteri Mozambicci, &c. Bologna: 1877.

Not seen by the Recorder; the new species described from Mozambique are *Stenocora livingstoni*, *Phymatosterna inhambanensis*, *Apate bicolor*, and *Aspidomorpha fenestrata*.

DELIHERM DE LARCENNE, E. Catalogue des Insectes Coléoptères trouvés dans les départements du Gers et de Lot-et-Garonne. Agen : 1877, 8vo.

Cicindelidæ—*Hydrophilidæ*.

EVERTS, E. Lijst der in Nederland voorkomende Schildvleugelige Insecten (*Coleoptera*). 's Gravenhage : 1875, large 8vo, pp. 116.

Raises the somewhat meagre fauna list to 2145. A supplement by the author, Tijdschr. Ent. xx. pp. 168-185, contains a list of Netherland *Halticidæ*, by A. J. A. Leesberg.

GREDLER, P. V. Zur Käfer-Fauna Central Afrikas. Verh. z.-b. Wien, xxvii. [for 1877, published in 1878], pp. 501-522.

An enumeration (with occasional descriptions and indications of new species, &c.) of beetles taken by various members of the Tirol Mission, chiefly at Gondokoro and Khartum (certainly none from Central Africa). *Epomis circumscriptus*, *Ditomus depressus*, *Trogosita mauritanica*, *Silvanus sexdentatus*, *Dermestes vulpinus*, *Aphodius granarius*, *Corynetes rufipes*, *Tribolium ferrugineum*, *Alphitobius diaperinus*, and *Sitophilus oryzeæ* are among them.

KELLNER, A. Verzeichniss der Käfer Thüringens, mit Angabe der nützlichen und der für Forst-, Land-, und Garten-wirthschaft schädlichen Arten. Z. ges. Naturw. xlviii. [1876], pp. 341-472.

Contains 65 more species than the first edition, which appeared in 1873. Localities and indications of habits are given in each instance, with special notes on such as are injurious to man.

KIESENWETTER, H. VON. Naturgeschichte der Insecten Deutschlands, begonnen von Dr. W. F. Erichson, fortgesetzt von Prof. Dr. H. Schaum, Dr. G. Kraatz, und H. v. Kiesenwetter. Erste Abtheilung. Coleoptera. Fünfter Band, bearbeitet von H. v. Kiesenwetter. Erste Lieferung. Bogen 1 bis 13. Berlin : 1877, 8vo, pp. 200.

Describes the "*Anobiadæ*" (including *Bostrychidæ*), *Cicidæ*, and *Aspidophoridæ*. Reviewed by Kraatz, Deutsche E. Z. 1877, pp. 445 & 446.

— & KIRSCH, T. Die Käferfauna der Auckland-Inseln, nach Herm. Krone's Sammlungen beschrieben. Deutsche E. Z. 1877, pp. 153-174.

Twenty-eight species (3 new genera and 18 new species) were found. Krone gives some preliminary notes, in one of which is an amusing account of his narrow escape from being shot by mistake for a sea-lion, while stretched on the sand, collecting *Homalia*. *Trogosita mauritanica*, *Necrobis rufipes*, and *Sitophilus oryzeæ* have found their way to these islands.

KIRSCH, T. Beitrag zur Kenntniss der Coleopteren-Fauna von Neu Guinea. MT. Mus. Dresd., Heft. ii. pp. 135-161.

Enumerates 112 species, whereof 30 are new, 5 new genera also being characterized (*Curculionidæ* and *Halticidæ*). Of these, 6 are known from the Moluccas, 7 from Aru, Matabello, and Saylor, 2 from the Philippines, 6 from Australia and Fiji, 1 from Borneo, and 1 from Malacca, 90 being so far as known indigenous.

MÄKLIN, F. W. Diagnoser öfver några nya Siberiska Insektarter. Öfv. Fin. Soc. xix. pp. 15-32.

Although bearing date 1878, the above-quoted vol. is for 1876-77, and the paper (written in 1876) is included in this Record, though the species can only take priority as from the first-mentioned year. 23 new species of *Coleoptera* are described, resulting from Prof. Nordenskiöld's expedition to the Yenissei River in 1875, and for the most part taken by Dr. Stuxberg. Reuter describes 1 species of *Hemiptera* (postea).

MARSEUL, S. A. DE. Index des Coléoptères de l'Ancien-monde décrits depuis 1863, dans le Répertoire de l'Abeille et autres mémoires, ou Supplément au Catalogue des Coléoptères d'Europe et pays limitrophes. Paris: 1877, 12mo, pp. xvi. & 85.

Issued as part of L'Ab. xv., and intended to act not only as an Index to the same author's "Répertoire" [Zool. Rec. xiii. *Ins.* p. 10], but as a supplement to his 1866 Catalogue, and as the precursor of a new one. In the introductory part, a list of works and papers is given for use in studying the *Coleoptera* of the Old World, arranged both by authors' names and systematically.

OLIVEIRA, M. P. D'. Mélanges entomologiques sur les Insectes du Portugal. Coimbra: 1876, 8vo, pp. 69.

After some introductory general remarks, a Catalogue of Portuguese *Coleoptera* is commenced, the present part comprising the *Cicindelidæ* and *Carabidæ*. Some new species and varieties are described.

PERRIS, É. Larves de Coléoptères. Ann. Soc. Linn. Lyon (n.s.) xxiii. [for 1875, published in 1876], pp. 259-418; xxiii. [for 1876, published in 1877], pp. 1-430, pls. i.-xiv.

A work of even greater use, on account of its wider field, than the classic "Insectes du Pin Maritime" of the lamented author. The opinion is reiterated, from continued experience, that xylophagous insects which ordinarily attack in numbers, and are consequently the most dangerous, only occupy themselves with weakened and sickly trees; and that if by necessity they are driven to attack healthy trees, they are repelled by the abundance of sap. The work abounds with observations useful both to the entomologist and agriculturist; and the plates are admirably clear and well drawn. The different larvæ will be noticed *infra*. The work, as originally intended, comprised only such species as feed on the chestnut-tree.

PROVANCHER, L. Petite Faune Entomologique du Canada. I. Insectes: Coléoptères. Quebec: 1877, 12mo, pp. 800, woodcuts.

A reprint, with additions, of the articles in Nat. Canad. already recorded. Additions and corrections are given by the author in Nat. Canad. ix. p. 305 *et seq.*

REITTER, E., SAULCY, F. DE, & WEISE, J. Coleopterologische Ergebnisse einer Reise nach Südungarn und in die Transsylvanischen Alpen. Verh. Ver. Brünn, xv. pp. 3-30, pl. i.

One new genus (*Aleocharides*), several new species, and many interesting additions to the Hungarian fauna are described.

SCHÜDTE, J. C. De Metamorphosi Eleutheratorum Observationes: Bidrag till Insekternes Udviklings-historie. Pt. 8. Nat. Tids. (3) x. [1876] pp. 369-458, pls. xii.-xviii.

For former portions, see Zool. Rec. xi. p. 249. The present part continues the author's elaborate anatomical descriptions and figures of details of beetle larvæ, referring exclusively to the *Cerambycidae* [infra], of which also some pupæ are described in like manner.

STEIN, J. P. E. F., & WEISE, J. Catalogi Coleopterorum Europæ Editio secunda. Berolini: 1877, 8vo, pp. 209.

Elaborately reviewed by Kraatz, Deutsche E. Z. 1877, pp. 439-444. Also by E. v. Harold, in "Nomenclatorische und synonymische Bemerkungen zur zweiten Ausgabe des Catalogus Coleopterorum Europæ"; MT. Münch. ent. Ver. i. pp. 113-125 (see also Ent. Nachr. iii. pp. 153-158). Such of Harold's alterations, &c., as are original will be noticed *infra*. For a correction in Gemminger & Harold's Catalogue, see Reiche, Bull. Soc. Ent. Fr. (5) vii. p. clxv.

TÄSCHLER, MAX. Nachtrag zur Coleopteren-Fauna der Kantone St. Gallen und Appenzell. Ber. St. Gall. Ges. 1876-77, pp. 455-526.

Dates and localities only. Enlarges the list already given, *op. cit.* 1870-71. No analysis of statistics or total is given.

WOLLASTON, T. V. Coleoptera Sanctæ-Helenæ. London: 1877, 8vo, pp. 253, pl.

The result of six months' collecting in St. Helena. 203 species are recorded, of which many are new; 57 are considered as certainly, and 17 more as probably, introduced, 129 being strictly indigenous. There are no water-beetles, and the *Curculionidae* largely predominate, the *Cossonides* being by far the most numerous group. Very peculiar *Bembidina* occur, with small eyes, and of tree-frequenting habits.

Beetle perforations in fossil wood. C. Brongniart, Ann. Soc. Ent. Fr. (5) vii. pp. 215-220, pl. vii. No. 2, describes and figures two specimens of fossil coniferous wood, from the carboniferous and cretaceous formations, showing marks of the larvæ of beetles, which he thinks are either those of *Hylesinus* or an allied genus.

Fossil beetles. S. H. Scudder, Bull. U. S. Geol. Surv. iii. pp. 763 & 764, describes as new *Loricera glacialis* and *Loxandrus gelidus*, from interglacial deposits of Scarborough Heights, near Toronto.

Beetles in snow; Frey-Gessner, Pet. Nouv. ii. p. 111. (See also *Melolonthides*).

Beetles (40 species) found hibernating in the central cavity of *Glau-cium luteum* at Nice; Peragallo, Bull. Soc. Ent. Fr. (5) vii. p. clxxiv.

Monstrosities. G. Kraatz, Deutsche E. Z. 1877, pl. i. No. ii. pp. 55-66; O. Hermann, Term. Füzetek, 1877, p. 22, pl. ii.; L. v. Bandi, Bull. Ent. Ital. ix. p. 220, figs. (*Rhizotrogus marginipes* and *Acis punctata*).

On longevity in beetles; Bailliot, Feuil. Nat. vii. p. 62.

Notes on common beetles in captivity (*Cetonia*, *Curabus*, &c., the latter eating vegetable matter); J. W. Slater, Tr. E. Soc. 1877, pp. 277-279.

O. J. S. Bethune, Canad. Ent. ix. pp. 221-226, pl., describes and figures *Monochamus scutellatus*, Say, and *confusor*, Kby., *Clytus speciosus*, Say, and *robinie*, Forst., *Orthosoma cylindricum*, F., *Saperda candida*, F., *Oberrea tripunctata*, F., and *Chrysobothris femorata*, F., "a few common wood-boring beetles."

Geographical distribution of *Nitidulidae*, *Trogositidae*, *Cryptophagidae*, and *Lathridiidae*; E. Reitter, Deutsche E. Z. 1877, pp. 175 & 176.

Scotland. D. Sharp continues his list; Scot. Nat. iv. pp. 35 & 36, 80-84, 129-132, 176-180 (*Silpha*—*Agrilus*). Captures in Inverness-shire; G. C. Champion, Ent. M. M. xiv. p. 93.

Denmark. J. C. Schiödte, Nat. Tids. (3) x. [1875], pp. 57-62, adds some species and new localities to the fauna-list, referred to in Zool. Rec. xi. p. 249.

Elberfeld. Various small notes, including supplement to list of beetles found in gas-water; Cornelius, S. E. Z. xxxviii. p. 211.

Silesia. Additions to fauna, and observations on known species; K. Letzner, JB. schles. Ges. liv. pp. 208-217.

South Hungary, Siebenbürgen, &c.; account of excursion by M. von Hopffgarten, S. E. Z. xxxviii. pp. 221-232.

France. A. Fauvel's "Annuaire Entomologique pour 1877" (Caen and Paris: 1877, 12mo, pp. 148), contains various extracts, &c., referring to captures and synonymy, &c., of French species. Captures in Vendée; R. Vallette, Feuil. Nat. vii. p. 33. Reims (on metals of railroad, after much rain); C. Lebœuf, *l. c.* p. 34. Toulon; *l. c.* p. 39. Brionnais; A. Martin, *l. c.* p. 76. Meursault; E. André, *op. cit.* viii. p. 6. Charente-Inférieure; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. lx. Fontainebleau; M. Régimbart, *tom. cit.* p. xcix. Bonnaire, *l. c.* p. clxvi.

Corsica. Rarities found in a garden; Kosiorowicz, Bull. Soc. Ent. Fr. (5) vii. p. cxlvii.

Apennines; F. Piccioli, Bull. Ent. Ital. ix. p. 223.

Russia in Europe and Asia, and the Caspian Sea. J. Faust, Hor. Ent. Ross. xii. pp. 300-332, continues [Zool. Rec. xii. p. 276] his descriptions of new species and elucidation of others, discussing the *Trogides*, *Melolonthides*, *Buprestidae*, *Elateridae*, *Pythidae*, *Melandryidae*, *Cistelidae*, *Pedilidae*, *Cantharidae*, and *Edemeridae*, with synonymy of species described by him in the former portion of his work.

Japan. *Carabidae* by Putzeys (*Damaster* by Kraatz), *Staphylinidae* and *Pselaphidae* by Weise, *Silphidae* by Kraatz, *Nitidulidae*, &c., by Reitter, and *Scolytidae* by Eichhoff, mostly from Hiller's collections, described in Deutsche E. Z. 1877, pp. 81-128. Harold, *l. c.* pp. 337-367 Weise, pp. 367 & 368, and Reitter, pp. 369-383, describe further species.

British North America. J. Leconte gives the names of 153 species, including indications of some as new, and of some "races," taken during Selwyn's 1875 Exploration of Northern British Columbia and the Peace River and Pine River passes of the Rocky Mountains. Geol. Survey of

Canada, Rep. of Progress for 1875-76 (Ottawa: 1877, 8vo), Appendix iii. pp. 107-109.

Additions and corrections to the Quebec beetle-fauna; Provancher, Nat. Canad. ix. pp. 305-319, 320-338.

New Zealand. F. P. Pascoe, Ann. N. H. (4) xix. pp. 140-147, describes new genera and species of *Gyrinidæ*, *Parnidæ*, *Curculionidæ*, and *Pedilidæ*. D. Sharp, *tom. cit.* pp. 396-413, 469-487, describes *Elateridæ*.

Tasmania. Additions to the known Coleopterous fauna; C. O. Waterhouse, Ann. N. H. (4) xix. p. 256.

On synonymy of German species, as affected by alterations in Gemminger and von Harold's "Catalogus"; K. von Della Torre, Ent. Nachr. iii. pp. 49, 65, 81, 101, *et seqq.*

Serville's descriptions in the "Faune Française," 1821, analysed; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. lxxxvi.

Identifications of species described from specimens artificially coloured by Stentz; L. v. Heyden, Deutsche E. Z. 1877, p. 191.

A decoction of panama wood useful for cleaning specimens; L. Bleuse, Nouv. et faits, 1877, p. cxxviii.

CICINDELIDÆ.

G. H. Horn, Tr. Am. Ent. Soc. vi. p. 83, note, quotes the discovery by Leconte of a marginal sutural ridge on the underside of the head in all the genera found in America, though it does not exist in any of the American *Carabidæ*.

Amblychila cylindriciformis figured; C. V. Riley, Rep. Ins. Mo. ix. p. 98, fig. 29. An account of its habits (in Western Kansas); F. H. Snow, Am. Nat. xi. pp. 731-735. Also by S. W. Williston, Canad. Ent. ix. p. 163.

Cicindela maga, Lec., = *Dromochorus pilatii*, Guér.; *C. pilatii*, Lec., renamed *D. belfragii*, and *Dromochorus* considered a good genus, not near *Omus*, but representing *Dromica* in the New World. A. Sallé, Bull. Soc. Ent. Fr. (5) vii. pp. vii. & viii.

Cicindela purpurea, ♂, paired with *C. vulgaris*, ♀; J. A. Moffat, Canad. Ent. ix. p. 100 (Ontario).

Cicindela campestris, var. *guadarramensis*, Graells, = *nigrita*, Dej.; M. P. d'Oliveira, Mém. Ent. p. 14.

Cicindela campestris var., at Digne, more numerous than type; E. Honnorat, Feuil. Nat. vii. p. 63. On its habits; H. du Buysson, l. c. p. 140.

Cicindela germanica frequenting damp situations; E. Honnorat, *op. cit.* viii. p. 9.

Styphloderma, g. n., C. O. Waterhouse, Ann. N. H. (4) xx. p. 424. General characters of *Tetracha*, but with the anterior tarsi of the male as in *Megacephala*, and apterous. *S. asperatum*, sp. n., *ibid.*, Lake Nyassa.

Ctenostoma landolti, sp. n., E. Steinheil, MT. Münch. ent. Ver. i. p. 48, Espiritu Santo, Colombia.

CARABIDÆ.

New species from the Sandwich Islands; T. Blackburn, Ent. M. M. xiv. pp. 142-148.

W. Macleay, P. Linn. Soc. N. S. W. ii. pp. 213-217, mentions 23 species found at Port Darwin, describing 4 as new (1 new genus).

Additions to the Hungarian fauna, which is raised to 513 species; J. Frivaldszky, Term. füzetek, 1877, p. 135.

E. v. Chaudoir, Bull. Mosc. lii. pt. 1, pp. 188-268, describes new genera and species of *Truncatipennes*.

Elaphrines.

Elaphrus tuberculatus, sp. n., F. W. Mäklin, Öfv. Fin. Soc. xix. p. 16, River Yenissei.

Carabides.

Géhin's third letter "pour servir à l'histoire des insectes de la tribu des Carabides," has not been seen by the Recorder; it is abstracted in Pet. Nouv. ii. p. 136.

Nebria brevicollis, var. n. *iberica*, Oliveira, Mém. Ent. p. 21, Portugal.

Procrustes spretus and allies; G. Kraatz, Deutsche E. Z. 1877, p. 435.

Plectes, Fisch. Kraatz, l. c. pp. 33-47, discusses the flat species of *Carabus* found in the Caucasus, with synonymy, describing a new species, and *C. bibersteini*, Mén., var. n. *suramensis*, p. 40, Suram Mts. A confusion in *C. cumanus* and *bilbergi*, from the Caucasus and Dauria, noted; *id.* l. c. p. 67. Chaudoir, *tom. cit.* pp. 69-76, also discusses the Caucasus flat species, describing 2 as new, and varieties *kolenatii*, p. 70, and *fossiger*, p. 71, of *C. bibersteini*. The two apical segments of the abdomen of male *Carabi* have their upper surface strongly punctured behind.

Lamprocarabus bartolomæi, Mots., = *stiernewalli*, small race; *id.* l. c. p. 80.

Melan[o]carabus, Thoms. Kraatz, l. c. pp. 249-256, discusses *C. græcus*, Dej., *morio*, Mann., *trojanus*, Dej., *hungaricus*, F., *mingens*, Quensel, and *perforatus*, Fisch., with varieties and synonyms, and *C. scythus*, Mots.

Carabus. Varieties of German species described by Kraatz, l. c. p. 257 *et seq.*, including *C. cælatus* var. n. *schreiberi*, Illyria, *C. dalmatinus*, var. n. *macrelus*, Upper Carinthia, p. 258, *C. emarginatus*, var. n. *trentinus*, Trient, p. 264. Guesses at the identity of *C. repercussus*, Drap., &c.; *id.* l. c. p. 303.

Carabus mussini, Germ., = *osseticus*, Ad.; *C. schamyti*, Hampe, and *invictus*, Chaud., = *steveni*, Mén.; *C. kindermanni*, Hampe, = *bischoffi*, Chaud.; *C. reticulatus*, Hampe, = *scabripennis*, Chaud.; *C. productus*, Hampe, = *nordmanni*, Chaud., = *robustus*, Deyr.; *C. latus*, Dej., *gougéleti*, Reche., = *leptopus*, Thoms.; *C. carinifrons*, Chaud., *nec* Mots., renamed *acute sculptus*; Chaudoir, l. c. p. 76.

Carabus antiquus, Dej., var. n., *vieiræ*, from Leiria, Portugal, p. 18, *C. lusitanicus*, Dej., = *antiquus*, Dej., var., with observations on connecting links, *ibid.*, note; *C. vonheydeni*, Brûl., recharacterized, p. 20, Oliveira, l. c.

Carabus granulatus. A fifth known specimen with badly developed elytra of this very common insect, is made the occasion of a discussion on Pterygo-dimorphism in *Carabi*, analogous to that occurring in *Hemiptera*; Kraatz, *l. c.* p. 64. Puton, *Pet. Nouv.* ii. p. 137 [rightly] considers this and similar instances to be merely due to arrested development or individual anomaly. He has, however, found true dimorphism in *Carabus clathratus* and *granulatus* and *Feronia vulgata*, which are sometimes winged and sometimes apterous. *Ocyrops*, *Lathrobium*, and *Longitarsus* are also referred to as exhibiting similar instances.

Carabus nitens. On its European distribution; E. v. Harold, *SB. Münch. ent. Ver.* i. p. ix.

Calosoma. Observations on species from the Caucasus, and on a green var., *viridula*, of *C. punctiventris*, Reche.; Kraatz, *l. c.* p. 48.

Calosoma. The French species described; M. Baillot, *Feuil. Nat.* vii. p. 153.

Calosoma haligena, Woll., = *helenæ*, Hope, var.; T. V. Wollaston, *Col. St. Hel.* p. 3.

Ischnocarabus, subg. n. of *Carabus*, for *C. cychropalpus*, Peyron, and *C. (I.) tenuitarsis*, sp. n. (p. 79), Asia Minor; Kraatz, *l. c.* p. 78. Also *C. bessarabicus*, Fisch., p. 256.

Nebria geraldæi, sp. n., Oliveira, *l. c.* p. 22, Serra d'Estrella (= *punctatostriata*, Schaaf; L. v. Heyden, *MT. Münch. ent. Ver.* i. p. 14).

Procrustes hopfgarteni, sp. n., Kraatz, *l. c.* p. 437, E. Siberia.

Carabus (Plectes) kasbekianus, id. *l. c.* p. 40, Kasbek; *C. (P.) macropus*, p. 71, *kraatzii*, p. 72, *cupreus* (Blanchard), p. 74, Chaudoir, *l. c.* Caucasus; *C. sculptipennis*, id. *l. c.* p. 75, N. China; *C. tuerkheimi*, E. v. Harold, *MT. Münch. ent. Ver.* i. p. 141, Pekin (between *Eupachys* and *Cratoccephalus*): spp. nn.

Oychrides.

Damaster. Observations on the known species. Harold's specimen of *D. lewisi*, Rye, apparently has even a shorter elytral mucro than typical specimens from the Recorder [which, instead of connecting the species with *blaptoides*, would still further remove it from that insect], and the permanency of the short and broad mucro in *lewisi* is substantiated. Kraatz, *l. c.* pp. 86 & 87.

Damaster fortunii, Adams, var. from N. Japan; C. O. Waterhouse, *Ent. M. M.* xiv. p. 23.

Odontocanthides.

Casonia lignata, Chaud. [*Zool. Rec.* ix. p. 239], should be written *signata*; Chaudoir, *Bull. Mosc.* lii. pt. i. p. 266 [the paper in which this correction occurs absolutely teems with worse errors; e.g., p. 248, "*A. grandis*, Murrai, Vieux Calabaz," "*Philopheuga*," "*Anisodactylus*," "*Crgptobatis*," &c., after the usual manner of the *Bull. Mosc.*]; *C. (Plagiorrhysis) flavipes*, Chaud., = *flavicornis*, Er., p. 268.

Casonia seriepunctata, sp. n., id. *l. c.* p. 267, Zanzibar.

Otenodactylides.

Leptotrachelus pluriseriatus, sp. n., *id. l. c.* p. 264, Peru.

Galeritides.

Zuphiosoma, Cast., = *Diaphorus*; Chaudoir, *l. c.* p. 252. *Galerita americana*, L., to be used for large examples from Cayenne, and *geniculata* for var. from Antilles; *G. japonica*, Bates, = *nigripennis*, pp. 254 & 255. *Drypta plagiata*, Klug, = *distincta*, var., and var. n. *nigripennis*, Cape of Good Hope, p. 262; *D. japonica*, Bates, is probably not a var. of *lineola*, Dej., but = *virgata*, Chaud., p. 262; *D. lineola*, var. n. *philippinensis*, Manilla, p. 263.

Diaphorus cubanus, sp. n., Chaudoir, *l. c.* p. 252, Cuba.

Galerita jelskii, sp. n., *id. l. c.* p. 253, Peru.

Drypta allardi, p. 259, Cape Palmas, *connecta*, p. 260, Clarence River, S.E. Australia, spp. nn., *id. l. c.*

Zuphium hungaricum, J. Frivaldszky, Term. füzetek, 1877, p. 133, Southern Hungary; *Z. bocagii*, M. P. d'Oliveira, Mém. Ent. p. 27, Azambuja, Portugal: spp. nn.

Helluonides.

Meladroma (Mots.), g. n., Chaudoir, Bull. Mosc. lii. pt. 1, p. 247. Facies of certain *Anthiides*; allied to *Acanthogenius*, but with tarsi of considerable width, and tarsal clothing different. For *Helluo grandis*, Dej., *Acanth. dispar*, Lac., = *grandis*, Murray, = *opacus*, Laf., = *H. umbraculatus*, F., *H. grandis*, Boh., = *lugubris*, Schaum, and *M. gerstaeckeri*, sp. n., p. 248, S. Africa.

Tricnogenius, g. n., *id. l. c.* p. 249. Allied to *Meladroma* and *Acanthogenius*, differing from the former in the tarsi and the latter in the rugose non-pubescent antennæ, &c. For *Acanthogenius sculpturatus*, Gerst., *A. anthioides*, Chaud., *Helluo ferox*, Er., and *T. corpulentus*, sp. n., *ibid.* Transvaal.

Pleuracanthus collaris, sp. n., *id. l. c.* p. 251, Bahia.

Brachynides.

Pheropsophus parallelus. Observations on its violent crepitation and the effects of its vapour, with an incomprehensible remark that similar results are known in *Bledius crassicornis*; (Piroth) P. v. Gredler, Verh. z.-b. Wien, xxvii. p. 503.

Lebiides.

Allocota, Mots., recharacterized; it has nothing to do with *Pentagonica* or *Hexagonia* (which are moreover not themselves allied), but its true place is with *Physodera* and *Cryptobatis*. *A. viridipennis*, Mots., ♂ described. Chaudoir, Bull. Mosc. lii. pt. i. pp. 203-207. *Lachnoderma*, McL., also located here; *id. l. c.* p. 212.

Pentagonica. Affinities discussed, and H. W. Bates's erection of a special group for its reception considered valid; this group is considered transitional between the *Physoderides* and *Lebiides*. Chaudoir, *l. c.* p. 212.

Lebistina, Mots., recharacterized; it has nothing to do with *Lebia*, or even with the group, having villose ligula and paraglossæ, different antennæ and tarsal clothing in ♂, &c.; Chaudoir, *l. c.* p. 218.

Trigonothops, McL., recharacterized; *id. l. c.* p. 221.

Callida cardioidera, Chaud., = *prolixa*, Er.; *id. l. c.* p. 231.

Paraphæa, H. W. Bates, = *Anchista*, Nietner; *P. signifera*, Bates, = *Callida discophora*, Chaud., = *A. (Plochionus) binotata*, Dej.; *id. l. c.* p. 236.

Philophenga [script. -*pheuga*], Mots., recharacterized; *P. cyanea*, Mots., = *viridis*, Dej., var.; *Glycia viridicollis*, Lec., = *P. (Cymindis) purpurea*, Say, var.: *id. l. c.* p. 243.

Lionychus albo-notatus, Dej., var. n. *immaculatus*, M. P. d'Oliveira, Mém. Ent. p. 30, Coimbra; *L. albo-maculatus*, Luc., is also a var. of *albo-notatus*.

New genera and species :—

Saronychium, T. Blackburn, Ent. M. M. xiv. p. 142. Near *Cymindis*; claws strongly pectinate internally. *S. inconspicuum*, *ibid.*, Honolulu.

Asasiola, Chaudoir, *l. c.* p. 209. Very near *Cryptobatis*, but with no pubescence on fourth joint of antennæ, last joint of labial palpi less dilated, &c. *A. rutilans*, *ibid.*, no locality mentioned, *scutellaris*, p. 210, Ega, *insignis*, p. 211, Rio de Janeiro, *id. l. c.*

Notoxena, *id. l. c.* p. 226; differs from *Trigonothops* in its shorter labrum, more obliquely truncate apical joint of labial palpi, non-bilobate fourth joint of all the tarsi, well marked elevated line on the head, &c. For *T. nigricollis*? McL., redescribed.

Tecnophilus, *id. l. c.* p. 240. For Californian species wrongly referred hitherto to *Philotecnus*, and which from the structure of their ligula are removed from the *Callidides* and placed in the *Mimodromiides*. *Philotecnus nigricollis* and *ruficollis*, Lec., ? *Callida croceicollis*, Mén., and its var. *Philotecnus chloidipennis*, Mots., also *T. pilatii*, p. 239, Texas, and an insect dubiously named *glabripennis*, p. 242, note, Nevada.

Dromius putzeysi, M. P. d'Oliveira, Mém. Ent. p. 28, Coimbra.

Euphlynes batesi, E. v. Harold, Deutsche E. Z. 1877, p. 341, Nipon.

Cryptobatis brevipennis and *inequalis*, Chaudoir, *l. c.* p. 208, River Amazon.

Pentagonica bifasciata, p. 214, Mexico, *trimaculata*, *ibid.*, *scutellaris* and *obscura*, p. 215, *picea*, p. 216, Brazil, *olivacea*, p. 216, New Caledonia *vittipennis*, p. 217, Australia, *id. l. c.*

Lebistina lebecaffra [sic], *id. l. c.* p. 220, Natal.

Trigonothops longiplaga, p. 222, Melbourne, *flavo-fasciata*, p. 223, with var. *nigro-signata*, p. 224, and *dimidiata*, p. 224, S. Australia, *id. l. c.*

Demetrias nigricornis, Mantchuria, *longicollis*, Amur, *id. l. c.* p. 228.

Callida rufiventris, p. 229, Transvaal, *viridi-aurea*, p. 230, Peru, *sulcata*, p. 231, Guatemala, *id. l. c.*

Otoglossa ruftarsis, *id. l. c.* p. 231, Nicaragua.

Menidius monogrammus, *id. l. c.* p. 232, Chili.

Crossoglossa piceola, *id. ibid.*, Amur.

Agra serie-foveata, *id. l. c.* p. 233, Peru.

Arsinoe biguttata, id. *ibid.*, Gaboon.

Metaxymorphus cycloderus, Cape of Good Hope, and *vittiger*, Natal, id. l. c. p. 234.

Anchista eurydera, p. 236, East India, *glabra*, p. 237, Pondicherry, *subpubescens*, Hindostan, and *picea*, Deccan, p. 238, id. l. c.

Philophenga horni, p. 245, Nevada, *subcordata*, p. 246, Mexico (? = *purpurea*, Say, var.), id. l. c.

Pericalides.

Cyphocoleus, g. n., Chaudoir, Bull. Mosc. lii. pt. 1, p. 188. Intermediate between the *Anchomenides* and *Thyreopterides*, having the ligula formed as in the first, but approaching *Oxyglossus* in having no spines on the tibiae except very small terminal ones; elytra gibbous. *C. heterogenus*, p. 191, *cardiopterus*, p. 193, *cychroides*, p. 196, spp. nn., New Caledonia.

Stenognathus longipennis, p. 197, New Granada, *batesi*, p. 198, Chontales, spp. nn., id. l. c.

Holcoderus auripennis, p. 198, *limbipennis*, p. 199, spp. nn., id. l. c., Pulo Penang.

Coptodera subapicalis, sp. n., Putzeys, Deutsche E. Z. 1877, p. 84, Japan.

Catascopus cupreicollis, C. O. Waterhouse, Tr. E. Soc. 1877, p. 1, Andaman Isles; *C. andamensis*, p. 200, Andaman Isles, *mexicanus*, p. 201, Mexico, Chaudoir, l. c. : spp. nn.

Lehis rufipes, sp. n., Chaudoir, l. c. p. 201, Chontales.

Eurycoleus septem-plagiatus, sp. n., id. l. c. p. 202, Brazil.

Pseudomorphides.

Paussotropus, g. n., C. O. Waterhouse, Tr. E. Soc. 1877, p. 3. Closely allied to *Adelotopus*, but with the prosternum not produced behind, and tarsi extremely short. Structure of legs and tarsi resembling *Hylotorus* in the *Paussidæ*. *P. parallelus*, sp. n., *ibid.*, Batchian.

Adelotopus collaris, Siam, *marginatus*, Java, spp. nn., id. l. c. p. 2.

Pseudomorpha gerstaeckeri, sp. n., Chaudoir, Bull. Mosc. lii. pt. 1, p. 202, San Paulo, Brazil.

Ozænides.

Pseudozæna alternata, sp. n., H. W. Bates, P. Z. S. 1877, p. 152, pl. xxiv. fig. 2, Duke of York Island.

Ditomides.

Aristus capito, Dej., var. n. *obscuroides*, M. P. d'Oliveira, Mém. Ent. p. 46, Leiria, Portugal.

Scaritides.

Mouhotia gloriosa, Cast. : on its variations and habits, H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. clxxiii.

Psilus, g. n., Putzeys, CR. Ent. Belg. xx. p. xli. (no differential characters given). *P. acutipalpis*, sp. n., id. *ibid.* Calcutta.

Dyschirius porosus, pl. xl. Burma, *schmidtii*, p. xli. Calcutta, spp. nn., id. l. c.

Clivina grammica, pl. xli., *pluridentata*, p. xlii., and *semicarinata*, p. xlv., Calcutta, *truncata*, p. xlv. Amboyna, spp. nn., *id. l. c.*

Carenium darwiniense, sp. n., W. Macleay, P. Linn. Soc. N. S. W. ii. p. 214, Port Darwin.

Carenidium spaldingi, sp. n., *id. ibid.* Port Darwin.

Chlœniides.

Oodes mauritanicus, Luc., = *O. (Lonchosternus) hispanicus*, Dej.; *O. abaxoides*, Luc., = *Orthomus barbarus*, Dej. L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xviii.

Pristomachærus quadriguttatus and *quadricolor*, spp. nn., J. Putzeys, S. E. Z. xxxviii. p. 101, Darjeeling.

Oodimorphus badeni, sp. n., *id. l. c.* p. 154, Madagascar.

Cnemacanthides.

Brosocosoma ribbei, sp. n., *id. l. c.* p. 100, Darjeeling.

Cratocerides.

Somoplatus marseuli, Chaud., = *fulvus*, Muls.; *Melanotus hidalgoi*, Per. Arc., = *picticornis*, Heyd.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Anisodactylides.

Anisodactylus niloticus, sp. n., P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 504, Gondokoro.

Harpalides.

Harpalus-larvæ feeding on eggs of *Caloptenus spretus* (Orthoptera), described and figured; C. V. Riley, Rep. Ins. Mo. ix. p. 97.

Harpalus ruficornis swarming from collar to garret in an uninhabited house at Woretz, in Croatia, which contained flour and other edible stores; A. Makowsky, Verh. Ver. Brünn, xv. S.B. p. 21.

Harpalus caspius, Stev., corrected to *caspicus*; E. v. Harold, MT. Münch. ent. Ver. i. p. 115.

Dichirotrichus barbarus, Leder, = *præustus*, Heyd.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Stenolophus discophorus, Fisch., var. n. *nigricollis*, M. P. d'Oliveira, Mél. Ent. p. 53, Coimbra.

Harpalus gondocorensis, sp. n., P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 505, Gondokoro.

Feroniides.

Molops sturmi, Ktz., = *orthogonius*, Chaud.; J. Frivaldszky, Term. füzetek, 1877, p. 136.

Pacilus numidicus, Luc., is a good species, *ex. typ.*; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xviii.

Pacilus nitidus, Dej.; Spanish localities recorded by Uhagon, Pet. Nouv. ii. p. 107.

Pterostichus souzæ, Vuillf., = *brevipennis*, Chevr.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Feronia (Haptoderus) melas, Creutz., corrected as *melena*; *F. bucephalus* as *bucephalus*; E. v. Harold, MT. Münch. ent. Ver. i. p. 114.

Amara. On habits of *A. curta*, *vulgaris*, and *montivaga*; G. de Rossi, Ent. Nachr. iii. p. 79.

Coronacanthus, g. n., W. Macleay, P. Linn. Soc. N. S. W. ii. p. 215. Spine of inner apex of front tibiae curved. No affinities suggested. *C. sulcatus*, sp. n., p. 216, Port Darwin.

Coptocarpus planipennis, sp. n., *id.* l. c. p. 216, Port Darwin.

Feronia (Platysma) stuxbergi (? = *Pseudocryobius subgibbus*, Mots.), p. 17, *theeli*, p. 18, *gelida* and *scita*, p. 19, *fragilis* and *infima*, p. 20, spp. nn., F. W. Mäklin, Öfv. Fin. Soc. xix., various Siberian localities, near the R. Yenisei.

Eudromus emarginatus, sp. n., J. Putzeys, S. E. Z. xxxviii. p. 154, Madagascar.

Amara proxima, J. Frivaldszky, Term. füzetek, 1877, p. 134, Southern Hungary; *A. darjelingensis*, J. Putzeys, l. c. p. 102, Darjeeling: spp. nn.

Celia levicollis, sp. n., F. W. Mäklin, l. c. p. 21, Krasnoyarsk.

Anchomenides.

Observations on species occurring in the Sandwich Islands, and on the difficulty of satisfactorily placing them in *Anchomenus* or *Dyscolus*; the fourth joint of the tarsi is specially wide in all, and the usual dilatation of front tarsi in the male scarcely to be traced. T. Blackburn, Ent. M. xiv. pp. 143 & 144.

Sphodrus. Various observations on Algerian species; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. cx.

Pristonychus crassicornis, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 98, Daya, Algeria (= *Sphodrus complanatus*, Dej., ex. typ.; L. Bedel, Bull. Soc. Ent. Fr. 5, vii. p. cx.).

Calathus amaroides, sp. n., J. Putzeys, S. E. Z. xxxviii. p. 103, Darjeeling.

Platynus glacialis, sp. n., E. Reitter, Verh. Ver. Brünn, xv. p. 7, Kerzer range of the Transylvanian Alps.

Anchomenus muscicola, p. 144, *epicurus*, *protervus*, *scrupulosus*, and *fraternus*, p. 145, *meticulosus*, *cuneipennis*, *fossipennis*, *oceanicus*, and *bardus*, p. 146, *fugitivus* and *mysticus*, p. 147, spp. nn., T. Blackburn, l. c., Sandwich Islands (chiefly Oahu Mts.).

Dyscolus tantalus and *palmae*, p. 147, *mutabilis* and *caliginosus*, p. 148, spp. nn., *id.* l. c., Oahu Mts.

Trechides.

Anophthalmus schumi, Schm., is not only earlier than *globulipennis*, Schm., but the latter if anything is the variety; *A. schumi*, Pand., is therefore renamed *pandellæi*: G. Kraatz, Deutsche E. Z. 1877, p. 192.

Oopterus (placed near *Trechus*) *guerini*, p. 158, *laticollis*, p. 159, spp. nn., T. Kirsch, Deutsche E. Z. 1877, p. 159, Auckland Isles.

Trechus punctato-striatus, sp. n., Putzeys, Deutsche E. Z. 1877, p. 85, Japan.

Anophthalmus merkli, J. Frivaldsky, Term. füzetek, 1877, p. 246, Transylvanian Alps; *A. suaneticus*, E. Reitter, Deutsche E. Z. 1877, p. 289, Caucasus: spp. nn.

Bembidiides.

The *Bembidia* of St. Helena are very characteristic and manifestly aboriginal, being mostly apterous and tree-frequenting; T. V. Wollaston, Col. St. Hel. pp. 5-7.

Limnastus galilæus, Brül., with imperfectly developed eyes, found near Bastia; A. de Perrin, Bull. Soc. Ent. Fr. (5) vii. p. lvii.

Apteromimus, subg. n. of *Bembidium*, p. 7; apterous, with very small eyes, prothorax angulated behind; for *B. platyderoides*, sp. n., p. 9, St. Helena: Wollaston, l. c.

Pseudophiloch[er]thus, subg. n. of *Bembidium*, p. 7; allied to above, but prothorax rounded behind, antennæ filiform. For *B. nubigena*, p. 10, grayanum, p. 11, *sublimbatum*, p. 12, *trechoides*, p. 13, spp. nn., St. Helena; id. l. c.

Endosomatium, subg. n. of *Bembidium*, p. 8; antennæ mouiliform. For *B. megalops*, p. 14, *dicksoniæ* and *rufo-suffusum*, p. 15, *gemmulipenne*, p. 16, *fossor*, p. 17, *evanescens*, p. 18, spp. nn., St. Helena; id. l. c.

Bembidium misellum, sp. n., E. v. Harold, Deutsche E. Z., 1877, p. 342, Yeddo.

DYTISCIDÆ.

SHARP, D. Observations on the Respiratory Action of the Carnivorous Water-beetles (*Dytiscidæ*). J. L. S. xiii. pp. 161-183.

Experiments on *Pelobius hermanni*, *Hydrovatus chlypealis*, Shp., *Hyphydrus ovatus*, *Hydroporus inæqualis*, *pictus*, *gyllenhalli*, *elegans*, and *12-pustulatus*, *Noterus sparsus*, *Laccophilus obscurus*, *Colymbetes exoletus*, *Ilybius fuliginosus*, *Agabus bipustulatus*, *Acilius sulcatus*, var., *A. fasciatus*, and *Dytiscus marginalis*. The habits of the first two of these accord with their structural peculiarities, and they are, in the author's opinion (with *Amphizoa*), the most primitive of the existing forms of *Dytiscidæ*. Both remain under water a very long time, the ratio of the concealed and breathing times being 375 to 1, whereas in the highly-developed *Dytiscus marginatus* the ratio is only 12 to 1. The grade of development bears a direct proportion to the activity, corroborating Herbert Spencer's generalization.

Dytiscus. M. Régimbart, Ann. Soc. Ent. Fr. (5) vii. pp. 263-274, pl. vi. figs. 6-12, describes the copulatory organs and genital functions in this genus (and *Cybister*). Copulation and ovipositing take place several times, and a male has been observed in connection with several females in succession, at slight intervals.

The same author, l. c. pp. 347-354, enumerates the *Dytiscidæ* collected by C. Piochard de la Brûlerie in his Eastern travels. *Cybister africanus*, Cast., is considered distinct from *tripunctatus*, Ol.; *Hydaticus rufulus*, Aubé, = *leander*, Rossi, var.; *Agabus fontinalis*, Steph., and *nigricollis*,

Zoubk, = *nitidus*, F., which is not separable from *biguttatus*, Ol. A further note on varieties, &c.; *id. l. c.* Bull. p. cxl.

Dytiscus. The same author gives specific characters of the European species; Feuil. Nat. vii. pp. 113–115, pl. ii. [much above the average].

Haliplus borealis, sp. n., J. Gerhardt, Z. E. Ver. Schles. 1877; renamed *wehnckii*, *id.* Deutsche E. Z. 1877, p. 448.

Hyphydrus xanthomelas, Régimbart, Bull. Soc. Ent. Fr. (5) vii. p. lxxx., and Ann. p. 361, Manilla; *H. contiguus*, p. 150, *decem-maculatus*, p. 151, Australia, *madagascariensis*, p. 150, Madagascar, E. Wehncke, S. E. Z. xxxviii.: spp. nn.

Hydrovatus (Oxynoptilus) ferrugatus, sp. n., Régimbart, *ll. cc.* pp. lxxix. & 360, Manilla.

Hydroporus piochardi, p. 350, *sedilloti*, p. 352, Djebel-ech-Cheik, *multiguttatus*, p. 351, Borak, *cyprius*, p. 352, Cyprus, *id.* Ann. Soc. Ent. Fr. (5) vii.; *H. pseudo-geminus* (p. lxxix.), p. 360, *atomus* (p. lxxx.), p. 361, *id. ll. cc.*, Manilla; *H. duodecim-maculatus*, p. cxxxiii., Algeria, Corsica, Sardinia, *discedens*, p. cxxxix., France, *id. l. c.*; *H. 11-lineellus*, L. Fairmaire, Pet. Nouv. ii. p. 141, Tougourt, N. Africa: spp. nn.

Desmopachria varians, sp. n., Wehncke, *l. c.* p. 151, Brazil.

Hydrocanthus auritus, sp. n., Régimbart, *ll. cc.* pp. lxxix. & 359, Manilla.

Laccophilus baeri (p. lxxviii.) and *transversalis* (p. lxxix.), p. 357, *proteus* (p. lxxix.), p. 358, *hydatioides* (p. lxxix.), p. 359, spp. nn., *id. ll. cc.*, Manilla.

Agabus fusco-eneascens, sp. n., *id. l. c.* p. cxlviii., Austria.

Copelatus quadrisignatus, sp. n., *id. ll. cc.* pp. lxxviii. & 356, Manilla.

Hydaticus baeri, *id. ll. cc.* pp. lxxviii. & 355, *leveillei*, *id.* Bull. l. c. & (= *philipp[in]ensis*, Wehncke, 1876) Ann. p. 356, spp. nn., Manilla.

Cybister simoni, p. cli., Cape York, *distinctus*, p. clvii., Senegal, spp. nn., *id.* Bull. Soc. Ent. Fr. (5) vii.

GYRINIDÆ.

Epinectus, Esch., corrected to *Epinectes*, and retained as a subgenus of *Enhydrus*, Cast., for the non-Australian species, of which *Enh. sulcatus*, Wied. (pl. vi. fig. 1), is the type; Régimbart, Ann. Soc. Ent. Fr. (5) vii. p. 105.

Porrorrhynchus [sic, following Agassiz: rectius *Porrorrhynchus*, as *Porro-* is not aspirated in Latin compounds; if it were, the name should à fortiori be written *Porrorrhynchus*] *marginatus*, Lap., ♂ elytron figured; *id. l. c.* fig. 3.

Enhydrus (Epinectes) tibialis, p. 107, pl. vi. fig. 2, Brazil, *atratus*, p. 109, Panama, spp. nn., *id. l. c.*

Gyrinus huttoni, sp. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 141, New Zealand.

Porrorrhynchus tenuirostris, p. 111, fig. 4, Cochin China, *brevirostris*, p. 113, fig. 5, Ceylon, Java, spp. nn., Régimbart, *l. c.*

HYDROPHILIDÆ.

Hydrophilus piceus. A purely histological paper on the contraction of the striated muscles of the legs and head of this beetle, resulting (according to the author) in nothing sufficient for the foundation of a hypothesis; L. Fredericq, Bull. Ac. Belg. (2) xli. [1876], pp. 583-594, pls. i. & ii. See also preliminary observations by E. van Beneden, *tom. cit.* pp. 452-457. Observations on polymorphism in the ♀, and on the differences between this species and *H. aterrimus*, Esch., in the descriptions by Sturm and Redtenbacher; L. Camerano, Atti Acc. Tor. xii. pp. 730-738, pl. xi.

Philhydrus melanocephalus, Er., *nec* Ol., = *4-punctatus*, Hbst.; *P. atricapillus*, Steph., = *bicolor*, Gyll. (*nec* F., *nec* Payk.), = (*Enochrus*) *melanocephalus*, Ol.; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. clxxvii. *P. suturalis*, Sharp, = *coarctatus*, Gredl.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Philhydrus subsignatus, sp. n., E. v. Harold, Deutsche E. Z. 1877, p. 342, Japan.

HELOPHORIDÆ.

Hydrochus obtusicollis, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 141, Morocco.

SPHÆRIDIDÆ.

Cyclomotum pictum, sp. n., T. Kirsch, Deutsche E. Z. 1877, p. 159, Auckland Isles.

PAUSSIDÆ.

Paussus should be written *Pausus*; E. v. Harold, MT. Münch. ent. Ver. i. p. 116.

Arthropterus kuehli, sp. n., J. P. E. F. Stein, MT. Münch. ent. Ver. i. p. 28, in amber, Ostseestrande.

STAPHYLINIDÆ.

A. FAUVEL, Ann. Mus. Genov. x. pp. 168-298, describes the *Staphylinidæ* of Australia and Polynesia. Amongst other European species, *Trogophleus exiguus* is recorded from Queensland, p. 195. A summary, contributed to the 1877 "Réunion des Sociétés savantes des départements," is abstracted in Pet. Nouv. ii. p. 125.

List of species taken by C. van Volxem in Portugal, Spain, Morocco, and Lapland; A. Fauvel, CR. Ent. Belg. xx. pp. xii.-xiv. In Brazil and La Plata; *id.* l. c. pp. xxiv.-xxviii.

MULSANT, E., & REY, C. Histoire naturelle des Coléoptères de France. Brévipennes. "Staphyliniens" and "Xantholiniens." Paris: 1877, 2 vols., 8vo [see Zool. Rec. xiii. Ins. pp. 30 & 36].

Aleocharides.

Myrmecocephalus, MacL., = *Falagria*; A. Fauvel, Ann. Mus. Genov. x. p. 295. *M. bicingulatus*, MacL., = *F. fauveli*, Solsky, p. 296.

Myrmedonia bituberculata, Bris., = *fussi*, Ktz.; G. Kraatz, Deutsche E. Z. 1877, p. 448. It lives in nests of *Andrena parvula* at Elbœuf; Levoiturier, Pet. Nouv. ii. p. 142. Both sexes taken.

New genera and species :—

Pseudoscopæus, J. Weise, Verh. Ver. Brünn, xv. p. 8. Allied to *Falagria*, and placed between that genus and *Borboropora*, though with five joints to all the tarsi. *P. reitteri*, id. l. c. p. 9, pl. i. fig. 1, Oberkerz, Transsylvanian Alps.

Halmæusa, Kiesenwetter, Deutsche E. Z. 1877, p. 160. Differs from *Silusa* in the least prolonged parts of the mouth and different maxillary palpi; facies of *Stenusa* or still more of *Leptusa*; intermediate tarsi 5-jointed. *H. antarctica*, p. 161, Auckland Isles.

Mayetia, Mulsant & Rey, Ann. Soc. Linn. Lyon (n. s.), xxii. [for 1875, published in 1876], p. 9. Facies of *Euplectus*; to be placed near *Borboropora*. *M. sphaerifer*, p. 10, Massane, Eastern Pyrenees. [Also published in Opusc. Ent. xvi.; cf. Zool. Rec. xii. p. 299.]

Leptusa carpathica, J. Weise, Verh. Ver. Brünn, xv. p. 10, pl. i. fig. 2, Transsylvanian Alps.

Hoplândria (?) *conveza*, id. Deutsche E. Z. 1877, p. 88, Japan.

Oxyopoda damrii, p. 229, and var. ? *persimilis*, p. 230, note, *referens*, p. 230, Mulsant & Rey, l. c. Corsica; *O. lata*, Weise, Deutsche E. Z. 1877, p. 97, Japan.

Polylobus cinctus, p. 284, and *apicalis*, p. 285, Fauvel, Ann. Mus. Genov. x. Victoria.

Calodera inæqualis, p. 286, *australis* and *cribrella* [*cribellum*!], p. 287, id. l. c. Australia.

Aleochara subœnea, New Zealand, *marginata*, Cape York, p. 291, *semi-rubra*, p. 293, Queensland, id. l. c.; *A. trisulcata*, Weise, l. c. p. 88, Japan.

Colpodota (*Acrotona*) *abbreviata*, Mulsant & Rey, l. c. p. 231, Corsica [Zool. Rec. xii. p. 299].

Microdota (*Philhygra*) *transposita*, p. 231, *M. sericata*, p. 232, *nana*, p. 233, *secretæ*, p. 235, Corsica, *cælifrons*, p. 234, Montpellier, iid. l. c. [as to the third and last of these, see Zool. Rec. xii. p. 299].

Sipalia scabripennis, p. 235, *cavipennis*, p. 238, *sublevis* [the authors ask if *Leptusa levigata*, Scriba, 1867, is to be referred to their species] p. 239, *revelieri*, p. 241, *levata*, p. 247, *punctulata*, p. 248, Corsica, *impressa*, p. 242, Var, *tenuis*, p. 244, Sos, *subconveza*, p. 249, Pyrenees, iid. l. c. [as to last and antepenultimate, see Zool. Rec. xii. p. 299].

Liota hypogæa, iid. l. c. p. 191, Massane [Zool. Rec. xii. p. 299, as *Aleuonota*].

Homalota helenensis, T. V. Wollaston, Col. St. Hel. p. 25, St. Helena; *H. variolosa*, p. 89, *hilleri* and *H. (Brachida) clara*, p. 90, Weise, l. c. Japan.

Gyrophana triquetra, Weise, l. c. p. 91, Japan.

Tachyporides.

G. H. HORN, Tr. Am. Ent. Soc. vi. pp. 81-128, pl. i., gives a "Synopsis of the Genera and Species of the Staphylinide tribe *Tachyporini* of the United States." He subdivides it into *Hypocypti*, *Tachypori*, *Bolitobii* (head margined at sides), and *Habroceri*. The sexual characters in *Tachinus* are discussed and figured. *Tachinus axillaris*, Austin, = *fumipennis*, Say; *Bolitobius rostratus*, Lec., nec Mots., renamed *quæstor*, p. 119. *Bryoporus* is a good genus; *B. testaceus* and *rubidus*, Lec., = *rufescens*, Lec.; *Hypocyptus zieglerti*, Lec., = *longicornis*, Payk.; *Trichophya* is considered as belonging to the *Quediides*, near *Acylophorus*. Bibliography and synonymy are given, and the plate shows various outlines of external anatomy.

Tachinus fumipennis, Say, differentiated from *axillaris*, Er.; E. P. Austin, Canad. Ent. ix. p. 92.

New genera and species :—

Anacyptus, Horn, l. c. p. 87. *Hypocypti*: exhibiting some affinity with the *Trichopterygida*, especially *Limulodes*. Joints 3-7 of antennæ together little longer than the second joint. For *H. testaceus*, Lec., and several old-world *Hypocypti*.

Trichopsenius, id. l. c. p. 88. Middle coxæ contiguous, metasternum and posterior coxæ absolutely fused, articular plates extending close to middle coxæ, &c. For *H. depressus*, Lec.

Physetoporus, id. l. c. p. 106. Intermediate between *Tachinus* and *Erchomus*. For *Coproporus grossulus*, Lec.

Hypocyptus crotchii, id. l. c. p. 86, British Columbia.

Tachinoderus hæmorrhous, Tasmania, *australis*, Queensland, A. Fauvel, Ann. Mus. Genov. x. p. 277.

Tachinus obesus, Weise, Deutsche E. Z. 1877, p. 92, Japan; *T. semirufus* and *tachyporoides*, p. 94, *agilis* and *angustatus*, p. 95, *debilis* and *repandus*, p. 96, *mimus* and *addendus*, p. 97, *parallelus*, p. 98, *canadensis*, p. 99, *schwarzi*, p. 100, *crotchii*, p. 101, *nitiduloides*, p. 102, various parts of the North American continent, Horn, l. c.

Habrocerus schwarzi, Horn, l. c. p. 124, Michigan.

Tachyporus elegans, p. 103, Canada, *californicus*, p. 104, Pacific coast, id. l. c.

Erchomus inflatus, id. l. c. p. 107, Arizona; *E. scitulus*, Weise, l. c. p. 91, Japan.

Conosoma bisignatum, p. 110, *castaneum* and *parvulum*, p. 111, *scriptum*, p. 112, United States, Horn, l. c.; *C. tristiculum*, Weise, l. c. p. 92, Japan; *C. (Conurus) stigmatis*, Fauvel, l. c. p. 280, New South Wales.

Leucocraspedum sidne[y]ense, Fauvel, l. c. p. 281, Sydney.

Bolitobius intrusus, p. 115 (? = *cingulatus*, var.), *anticus*, p. 117, United States, Horn, l. c.; *B. irregularis*, Weise, l. c. p. 93, Japan.

Mycetoporus baudueri, Mulsant & Rey, Ann. Soc. Linn. Lyon (n.s.) xxii. [for 1875, published in 1876], p. 250, Sos [Zool. Rec. xii. p. 300]; *M. tenuis* (|| Muls.), Horn, l. c. p. 122, Lake Superior.

Quediides.

Quedius sidne[y]ensis and *sulcicollis*, p. 269, *nigricollis* and *thoracicus*, p. 271, *luridus* and *iridiventris*, p. 272, *versicolor*, p. 273, *æneus* and *cuprinus*, p. 274, spp. nn., A. Fauvel, Ann. Mus. Genov. x., Australia.

Heterothops luctuosa, p. 275, *picipennis*, p. 276, spp. nn., *id. l. c.*, Australia.

Staphylinides.

Leistotrophus cingulatus, Grav., a North American species, recorded from S. England; A. Matthews, Ent. M. M. xiv. p. 38.

Philonthus longipennis, Prov., = *sordidus*, Grav.; L. Provancher, Nat. Canad. ix. p. 308.

Staphylinus volæmi, sp. n., A. Fauvel, CR. Ent. Belg. xx. p. xxvii., Brazil.

Ocybus weisii, E. v. Harold, Deutsche E. Z. 1877, p. 344, Tokio; *O. brevicornis*, J. Weise, *tom. cit.* p. 367, Hakodadi: spp. nn.

Cafius areolatus, p. 251, *sabulosus*, p. 253, *littoralis*, p. 254, *seriatus*, p. 255, *catenatus* and *velutinus*, p. 256, various Australian localities, *nasutus*, p. 257, Fiji, *anchora*, p. 258, note, and *C. (?) speculifrons*, p. 259, note, New Caledonia, *densiventris* (? = *nauticus*, Fairm.), p. 258, E. Australia and Aru Isles, spp. nn., Fauvel, Ann. Mus. Genov. x.

Hesperus mirabilis, sp. n., *id. l. c.* p. 260, Queensland.

Philonthus flavo-terminatus, T. V. Wollaston, Col. St. Hel. p. 26, St. Helena; *P. antipodum*, p. 263, *macellus*, p. 264, *sanguinicollis* and *oreophilus*, p. 265, Fauvel, Ann. Mus. Genov. x., Australia: spp. nn.

Belonuchus dohrni, p. 266, Cape York, *brevicollis*, p. 267, Queensland, spp. nn., Fauvel, *l. c.*

Hadrotus hilleri, sp. n., Weise, *l. c.* p. 93, Japan.

Xantholinides.

Diachus octavii, Victoria, *divisa*, New South Wales, spp. nn., A. Fauvel, Ann. Mus. Genov. x. p. 235.

Xantholinus episcopalis, Fauvel, CR. Ent. Belg. xx. p. xxvi., Brazil; *X. lorquini*, Australia, Moluccas, and Celebes, and *rufitarsis*, New South Wales and Queensland, p. 241, *albertisi*, p. 246, Cape York, New Guinea, Aru, Ternate, Celebes, *socius*, p. 247, E. & S. Australia, *id.* Ann. Mus. Genov. x.; *X. armatus*, T. V. Wollaston, Col. St. Hel. p. 32, St. Helena: spp. nn.

Leptacinus breviceps, C. O. Waterhouse, Ent. M. M. xiv. p. 24, Zambesi, S.E. Africa; *L. novæ-hollandiæ*, Fauvel, Ann. Mus. Genov. x. p. 236, Rockhampton, Victoria: spp. nn.

Metoponcus semiruber, sp. n., Fauvel, *l. c.* p. 238, Fiji.

Pæderides.

Pinobius, MacL., = *Doliceon*; A. Fauvel, Ann. Mus. Genov. x. p. 225. *Lathrobiomorphus*, Mots., = *Scimbalium*, Er., p. 231.

Cryptobium (?) microcephalum, sp. n., *id. l. c.* p. 232, Australia.

Scimbalium australe, sp. n., *id. l. c.* p. 231, Australia.

Lathrobium ferreum, p. 228, *notaticolle* and *gratellum*, p. 229, *longiceps*, p. 230, *id. l. c.*, various Australian localities; *L. limitatum*, F. W. Mäklin, Öfv. Fin. Soc. xix. p. 22, Krasnoyarsk: spp. nn.

Lithocharis scolytina, p. 219, Fiji, *annulosa*, p. 220, Tahiti, *ignita*, p. 221 Queensland, *cincta*, p. 222, Queensland and New Guinea, spp. nn., Fauvel, *l. c.*

Scopæus ruficollis, sp. n., *id. l. c.* p. 218, Queensland.

Sumius australasiæ, p. 216, *guttula*, p. 217, spp. nn., *id. l. c.* New South Wales.

Paderus tenuicornis, Queensland, and *samoensis*, Ovalau, *id. l. c.* p. 224; *P. parallelus*, Weise, Deutsche E. Z. 1877, p. 368, Hakodadi: spp. nn.

Pinophilides.

Edichirus intricatus, sp. n., A. Fauvel, Ann. Mus. Genov. x. p. 211, Cape York.

Pinophilus ruftarsis, Tasmania, *æneiventris*, N. & E. Australia, p. 214, *curticornis*, p. 215, Queensland, *id. l. c.* spp. nn.

Stenides.

Stenus cæruleus, Pt. Bowen, *guttulifer*, K. George's Sound, p. 24, *bifrons* and *trepidus*, p. 25, Zambesi, C. O. Waterhouse, Ent. M. M. xiv.; *S. speculifrons*, A. Fauvel, CR. Ent. Belg. xx. p. xxv. Montevideo, Pampas; *S. caviceps*, *id. Ann. Mus. Genov. x.* p. 207, Cape York and New Guinea: spp. nn.

Oxytelides.

Descriptions of the species known to occur in the United States. The existence of inland species allied to those occurring on the coasts is to be accepted as evidence of the former distribution of ocean water, and any divergence between these forms gives an idea of the period of change of structure under different influences. *Distemmus argus*, Lec., is a *Homalium*, near *planum*. *Oxytelus depressus* in Indiana. *Trogophloeus* imitates widely diverse genera in form. J. L. Leconte, Tr. Am. Ent. Soc. vi. pp. 213-248.

Osorius politus, Florida, and *planifrons*, Southern States, *id. l. c.* p. 215; *O. sanguinipennis*, A. Fauvel, Ann. Mus. Genov. x. p. 192, Gayndah: spp. nn.

Oxyporus elegans, Louisiana, and *lepidus*, New York, spp. nn., Leconte, *l. c.* p. 215.

Cylindrogaster exilis, sp. n., E. Mulsant & C. Rey, Ann. Soc. Linn. Lyon (n.s.) xxii. [1876] p. 12, Massane, E. Pyrenees [Zool. Rec. xii. p. 302].

Bledius gularis, p. 218, Middle States, *fortis*, Texas, and *brevidens*, New York, p. 219, *ferratus* and *jacobinus*, p. 220, *cribricollis*, p. 221, *nitidiceps* and *opacifrons*, p. 224, *punctatissimus*, p. 226, *laticollis* and *luteipennis*, p. 227, *pleuralis*, p. 229, *phytosinus*, p. 231, California, *cuspidatus*, p. 222, Dakota, *rotundicollis*, p. 223, Nebraska, *sinuatus*, Canada and Illinois, *confusus*, Lake Superior, p. 228, *tau*, p. 230, New York, *cognatus*, p. 231, Carolina to Texas, *dimidiatus*, p. 232, Florida, Leconte, *l. c.*; *B. vilis*,

F. W. Mäklin, Öfv. Fin. Soc. xix. p. 22, Troitzskoy, Siberia; *B. capitalis* and *aterrimus*, Fauvel, Ann. Mus. Genov. x. p. 204, Australia: spp. nn.

Oxytelus melas, p. 196, Tasmania, *discipennis* and *vulneratus*, p. 197, *impennis* and *ocularis*, p. 198, *myops* and *occidentalis*, p. 199, *varius*, p. 201, *semirufus*, p. 202, *sparsus*, p. 203 (also from Java), various Australian localities, Fauvel, Ann. Mus. Genov. x.; *O. nitens*, id. CR. Ent. Belg. xx. p. xxiv., La Plata, Montevideo, Pampas; *O. iners*, p. 94, *marginatus*, p. 96, J. Weise, Deutsche E. Z. 1877, Japan; *O. niger*, p. 235, and *sobrinus*, p. 237, California, *convergens*, Florida, and *punctatus*, Vancouver's Island, p. 236, *placuosus*, p. 237, Washington, Leconte, l. c.: spp. nn.

Trogophleus simplarius, *convexus*, *bledianus*, and *uniformis*, p. 244, *lithocharinus* and *arcifer*, p. 245, *caloderinus* and *phlaeoporinus*, p. 246, Leconte, l. c., various N. American localities; *T. anceps*, Gayndah, *punctatus*, p. New South Wales, Fauvel, Ann. Mus. Genov. x. p. 194: spp. nn.

Thinobius gigantulus, p. 239, Texas, *oxytelinus*, p. 240, and *macropterus*, p. 241, California, *flavicornis*, New York, and *brachypterus* and *fimbriatus*, Michigan, p. 240, spp. nn., Leconte, l. c.

Ancyrophorus planus, p. 241, Lake Superior, *annectens*, p. 242, California, spp. nn., id. l. c.

Apocellus stilicoides, Florida, and *analis*, Louisiana, &c., spp. nn., id. l. c. p. 243.

Homaliiides.

Eudectus giraudi, Redt., var. n. *rufulus*, Japan; J. Weise, Deutsche E. Z. 1877, p. 96.

Boreaphilus anderskiöldi, sp. n., F. W. Mäklin, Öfv. Fin. Soc. xix. p. 25, Siberia.

Pycnoglypta sibirica, sp. n., id. l. c. p. 24, Siberia.

Microcalymma dicksoni, sp. n., id. *ibid.*, Siberia.

Olophrum limbatum, sp. n., id. l. c. p. 23, Siberia.

Amphichroum australe, sp. n., A. Fauvel, Ann. Mus. Genov. x. p. 191, New South Wales.

Homalium kronii, p. 161, *albipenne*, p. 162, *insulare* and *pacificum*, p. 163, *subcylindricum*, p. 164, Kiesenwetter, Deutsche E. Z. 1877, Auckland Isles; *H. divergens*, p. 26, *affine* and *confusum*, p. 27, *sagittatum* and *angustatum*, p. 28, *longitudum*, p. 29, *curtipenne*, p. 30, Mäklin, l. c., various Siberian localities; *H. tenue*, Weise, l. c. p. 95, Japan: spp. nn.

Piestides.

The North American genera tabulated, with explanatory observations; J. L. Leconte, Tr. Am. Ent. Soc. vi. pp. 249 & 250.

Ancæus prolixus, sp. n., id. l. c. p. 250, New York.

Leptochirus forticornis, sp. n., A. Fauvel, Ann. Mus. Genov. x. p. 185, Samoa.

Phlaeocharides.

Thermocharis subclavata, sp. n., E. Mulsant & C. Rey, Ann. Soc. Linn. Lyon (n.s.), xxii. [for 1875, published in 1876], p. 194, Massane, E. Pyre-

nees: = *cæca*, Fauv., = *paradoxa*, Saulcy, with which *diecki*, Saulcy, is also possibly identical; A. Fauvel, Bull. Soc. Ent. Fr. (5) vii. p. clii.

Phlæocharis parallela, sp. n., A. Fauvel, l. c. p. clii., Algeria.

Micropeplides.

This group, retained in the *Staphylinidæ*, with descriptions of the known N. American species; J. L. Leconte, l. c. pp. 250-252.

Micropeplus obliquus, sp. n., id. l. c. p. 252, British Columbia.

PSELAPHIDÆ.

SCHAUFUSS, L. W. Pselaphiden Siam's. Dresden: 1877, 4to, pp. 25.

Describes new species in the author's collection, and characterizes as new, genera also discussed as undescribed in Nunq. Ot. ii. p. 450 *et seq.*; *Zethus*, Schauf. [Zool. Rec. xiii. Ins. p. 40], is recharacterized.

The same author, Nunq. Ot. ii. pp. 450-460, continues his notices of various genera, describing in some cases representatives of some of his own hitherto without types, and indicating new genera. *Machærites plicatulus*, Schauf., is the type of *Facetus*, Sch.

A. Raffray, R. Z. (3) v. p. 279 *et seq.*, describes new genera and species found by himself in his voyages to Abyssinia and Zanzibar.

New genera and species:—

Octomicrus, Schaufuss, Nunq. Ot. ii. p. 452. Follows *Bryaxis*; antennæ with 8th joint smaller than 9th or 7th. No type mentioned. Again characterized; id. Psel. Siam's, p. 14, for *O. longulus*, ibid., Bangkok.

Metaxoides, id. Nunq. Ot. ii. p. 453. Allied to *Metaxis*, Mots.; antennæ with joints 9-11 almost as long as 1-7. No type mentioned. Again characterized; id. Psel. Siam's, p. 13, for *M. bruchiformis*, ibid., Bangkok.

Margaris, id. Nunq. Ot. ii. p. 453. Robust, with thick antennæ and legs, and very thin maxillary palpi; facies of *Tmesiphorus*. Type, *M. imperialis*, p. 454, Rockhampton.

Filiger, id. l. c. p. 454. Follows *Gamba*, Schauf.; with last joint of maxillary palpi filiform, acuminate. No type. Again characterized; id. Psel. Siam's, p. 17, for *F. ampliventris*, *cariniventris*, and *conicicollis*, ibid., Siam.

Somatipion, id. Nunq. Ot. ii. p. 457. Allied to *Chennium*, with two equal claws, five abdominal segments, narrowly margined, 3-jointed maxillary palpi, with last joint cultriform. Type, *S. globulifer*, p. 458, King George's Sound.

Enantius, id. l. c. p. 459. Also allied to *Chennium*, with 3-jointed maxillary palpi, and joints 8-11 of antennæ elongate, more than half the length of the whole. No type. Again characterized; id. Psel. Siam's, p. 18, for *E. punctipennis*, ibid., Bangkok.

Subulipalpus, id. Nunq. Ot. ii. p. 459. Allied to *Narcodes*, King, with fourth joint of maxillary palpi very small, awl-shaped. No type. Again characterized, and distinguished from *Centrophthalmus*, id. Psel. Siam's, p. 23, for *S. spinicosis*, ibid., Bangkok.

Tetratarsus (altered to *Tetrameres* on the same page!), *id.* Nunq. Ot. ii. p. 460. Allied to *Tamotus*; all the tarsi 4-jointed. No type. Again characterized; *id.* Psel. Siam's, p. 24, for *Tetratarsus plicatulus*, p. 25, Siam.

Clavigerodes, Raffray, *l. c.* p. 279. Very near *Claviger*, but with only 3-jointed antennæ. *C. abyssinicus*, *ibid.* pl. iii. figs. 11 & 12, Hamacen, Abyssinia.

Psilocephalus, *id.* *l. c.* p. 284. Build and facies of *Pselaphus*, but differing in the palpi, of which the 4th joint is dentate and penicillate (pl. iii. fig. 7). For *Psil. formicetorum*, *ibid.*, Hamacen.

Odontalgus, *id.* *l. c.* p. 286. Near *Pselaphus* in its palpi (pl. iii. fig. 5) and insertion of antennæ, which are dissimilar in the sexes; tarsi bi-articulate. *O. tuberculatus* and *vespertinus*, p. 287, Abyssinia.

Cliarthrus, *id.* *l. c.* p. 290. Between *Bythinus* and *Batrissus*. *C. bicolor*, *ibid.* pl. iii. fig. 14, Zanzibar.

Mirus, F. de Saulcy, Pet. Nouv. ii. p. 169. Near *Trichonyx*. No differential characters suggested. *M. permirus*, *ibid.*, Ajaccio.

Ctenistes major, p. 280, fig. 2, *saenenensis*, p. 281, figs. 4, 9, & 10, Raffray, *l. c.* pl. iii., Abyssinia.

Tmesiphorus costatus, Weise, Deutsche E. Z. 1877, pp. 99, Japan; *T. (?) collaris*, Raffray, *l. c.* p. 282, pl. iii. fig. 1, Zanzibar and Bagamoyo.

Enoptostomus formicarius, Raffray, *l. c.* p. 282, pl. iii. figs. 3, 15, Abyssinia.

Centrophthalmus armatus, *id.* *l. c.* p. 285, pl. iii. fig. 6, Abyssinia; *C. clementis*, p. 20, E. India, *forticornis* and *punctipennis*, p. 21 (the latter with varr. *inæqualis* and *punctatissimus*, p. 22), Siam, *4-striatus*, p. 22, Singapore, Schaufuss, Psel. Siam's.

Marellus palpator, Raffray, *l. c.* p. 285, pl. iii. figs. 8, 13, Abyssinia.

Pselaphus mehadiensis, J. Frivaldszky, Term. füzetek, 1877, p. 21, Mehadia, S. Hungary; *P. multangulatus*, p. 4, *canaliculatus*, p. 5, *bifoveolatus* and *articularis*, p. 6, Schaufuss, Psel. Siam's, Bangkok.

Zethus opacus, Schaufuss, Psel. Siam's, p. 12, Siam.

Stratus ursinus, *id.* Nunq. Ot. ii. p. 452, Yucatan or Teapa.

Jubus denticollis, p. 455, Mexico, *subopacus*, *semipunctatus*, and *spini-collis*, p. 456, New Granada, *id.* *l. c.*

Tychus semi-opacus, p. 3, *testaceus*, p. 4, *id.* Psel. Siam's, Bangkok.

Batrissus theodoros, p. 291, Blue Nile, *abdominalis*, p. 292, *sulcipennis*, p. 293, *gracilicornis*, p. 294, Abyssinia, *zanzibarcus*, p. 292, *sulcatus*, p. 294, Zanzibar, Raffray, *l. c.*; *B. septem-foveolatus*, p. 15, *excisus*, p. 16, Schaufuss, Psel. Siam's, Bangkok; *B. antennatus*, J. Weise, Deutsche E. Z. 1877, p. 97, Japan.

Trichonyx antennatus, Raffray, *l. c.* p. 295, pl. iii. fig. 16, Abyssinia.

Amaurops saulcii, Reitter, Deutsche E. Z. 1877, p. 291, Caucasus.

Bryaxis clavicornis, p. 288, Zanzibar, *obtusa* (pl. iii. fig. 17) and *abyssinica*, p. 289, Abyssinia, Raffray, *l. c.*; *B. baumeisteri*, p. 7, *cordata*, *mamilla*, and *siamensis*, p. 9, *fonensis* and *nigro-cephala*, p. 10, Schaufuss, Psel. Siam's, Siam, chiefly Bangkok; *B. tychoides*, Reitter, *l. c.* p. 291, Caucasus.

Bythinus ruthenus, F. de Saulcy, Verh. Ver. Brünn, xv. p. 12, pl. i. fig. 3, Hungary; *B. subseriatus*, Weise, *l. c.* p. 98, Japan.

Euplectus hipposideros, p. 12, *solskii*, p. 13, Schauffuss, Psel. Siam's, Siam; *E. nubigena* (Saulcy, MS.), p. 12, *filum*, p. 13, E. Reitter, Verh. Ver. Brünn, xv., Transsylvanian Alps.

Claviger lederi, Reitter, Deutsche E. Z. 1877, p. 290, Caucasus (with *Lasius flavus*).

Metopioides setifer, Schauffuss, Nunq. Ot. ii. p. 451, Brazil (? = *Goniastes sulcifrons*, Westw.).

SCYDMENIDÆ.

Ablepton, g. n., J. Frivaldszky, Term. füzetek, i. p. 17. Differs from *Leptomastax* in the head, mandibles, and labial palpi. *A. treforti*, sp. n., *id. l. c.* p. 18, pl. i. figs. 1 A-B, Mehadia.

Scydmaenus geticus, sp. n., F. de Saulcy, Verh. Ver. Brünn, xv. p. 14, pl. i. fig. 4, Banat.

Euconnus transsylvanicus, sp. n., *id. l. c.* pl. i. fig. 5, Transsylvanian Alps.

Cephennium turgidum, sp. n., E. Reitter, Deutsche, E. Z. 1877, p. 292, Caucasus.

SILPHIDÆ.

Necrophorus. Synoptical table of French species; R. Hickel and R. Dragicsevic, Feuil. Nat. vii. p. 27.

Necrophorus sepulchralis, Heer, a good species; G. Stierlin, Deutsche E. Z. 1877, p. 288.

Necrophorus vespillo, small form, eating a living *Pristonychus terricola*; Pet. Nouv. ii. p. 179.

Silpha. Observations on South Russian species; J. Faust, Bull. Mosc. lii. pt. 2, pp. 23-33.

Silpha obscura. A symmetrical colour var.; Masson, Feuil. Nat. vii. p. 143.

Silpha tetraspilota, Hope, = *rufithorax*, Wied.; E. v. Harold, Deutsche E. Z. 1877, p. 347.

Silpha sinuata and ? *Catops fumatus* and *varicornis*, from Japan; G. Kraatz, Deutsche E. Z. 1877, pp. 107 & 108. Also *S. rugosa* and *atrata*, E. v. Harold, *tom. cit.* p. 347.

Adelops meridionalis, Duv.: on its specific status and habits; A. Lucante, Feuil. Nat. vii. pp. 89-92.

Ploma [to] *scopus*, g. n., G. Kraatz, Deutsche E. Z. 1877, p. 102. Facies of *Creophilus* in the *Staphylinidæ*: a brevi-pennate *Necrophorus*, with the antennal club of *Silpha*. *O. morio* (figured *op. cit.* 1876, pl. i. fig. 17), Japan, and 4-maculatus, China, p. 104, spp. nn.

Arimimelus, g. n., *id. l. c.* p. 104. Allied to *Pteroloma*, but with the facies of a *Lebiid*. *A. lebioides*, sp. n., p. 105, Japan.

Necrophorus japonicus, E. v. Harold, Deutsche E. Z. 1877, p. 345, Hakone; *N. concolor*, p. 100, *maculifrons* and var. *quadripunctatus*, p. 101, spp. nn., Kraatz, *l. c.*, Japan (the latter = *nepalensis*, Hope; E. v. Harold, *tom. cit.* p. 346).

Silpha brunnecollis, Kraatz, *l. c.*, p. 106, Japan; *S. venatoria*, Harold, *l. c.* p. 346, Tokio: spp. nn.

Catops hilleri, p. 107, *pusillimus* and *fuscifrons*, p. 108, spp. nn., Kraatz, *l. c.*, Japan.

Choleva antipoda [-*dum*], sp. n., T. Kirsch, Deutsche E. Z. 1877, p. 164, Auckland Isles.

Catopomorphus curticornis, sp. n., L. Fairmaire, Bull. Soc. Ent. Fr. (5) vii. p. lxx., Constantinople.

CORYLOPHIDÆ.

Arthrolips politus, p. 192, Japan, *similaris*, Mendoza, *oberthuri* and *fenestratus*, Mexico, p. 193, E. Reitter, Verh. z.-b. Wien, xxvii. (these all referred to *Sacium*; id. MT. Münch. ent. Ver. i. p. 126); *A. regularis*, p. 7, Sos, *ferrugatus*, p. 9, Caucasus, Armenia, Corsica, id. L'Ab. xvi. *l. c.*: spp. nn.

Sacium rhenanum, p. 2, Rhine district, *latum*, p. 3, Caucasus, *orientale*, p. 4, Constantinople, *densatum*, p. 6, Central Europe (= *pusillum*, Duv., nec Gyll.), Reitter, L'Ab. xvi. [1877, *Sacium*]; *S. atrum*, id. MT. Münch. ent. Ver. i. p. 126, Mexico: spp. nn.

Sericoderus pallidus, id. Verh. z.-b. Wien, xxvii. p. 194, Japan; *S. castaneus*, p. 126, Japan, *fulvicollis*, ibid., and *pallidulus*, p. 127, Australia, id. MT. Münch. ent. Ver. i.: spp. nn.

TRICHOPTERYGIDÆ.

A. Matthews, Cist. Ent. ii. pp. 165-177, gives notes on 19 species found in America by the late G. R. Crotch (including 9 new). Two species of *Actidium*, 3 of *Ptilium* (which is almost exclusively European), *Hydroscapha natans*, Lec., and *Motschulskium sinuaticolle*, Matth., both from the West coast, are among them.

Ptilium marginatum, Aubé, from England; id. Ent. M. M. xiv. p. 36.

Actidium crotchianum, British Columbia, *politum*, California, spp. nn., id. Cist. Ent. ii. p. 168.

Ptilium columbianum, p. 169, British Columbia and California, *humile*, p. 170, San Diego, *obscurum*, p. 171, British Columbia, spp. nn., id. *l. c.*

Ptinella matthewsiana, sp. n., T. V. Wollaston, Col. St. Hel. p. 21, St. Helena.

Trichopteryx vicina, p. 172, *castanea*, p. 173, *xanthocera*, p. 174, *parallelipeda*, p. 175, and *cognata*, p. 176, British Columbia, *californica*, p. 174, Lake Tahoe, Matthews, Cist. Ent. ii.; *T. seminitens*, id. Ent. M. M. xiv. p. 36, England: spp. nn.

SCAPHIDIIDÆ.

Scaphisoma agaricinum. Larva (figs. 1-8) and pupa described; Perris, Ann. Soc. L. Lyon (n.s.), xxii. pp. 269-272.

Scaphidium japonum, sp. n., E. Reitter, Deutsche E. Z. 1877, p. 369, Japan.

Scaphisoma hæmorrhoidale, p. 369, *rubrum* and *castaneipennis*, p. 370, spp. nn., *id. l. c.*, Japan.

HISTERIDÆ.

The genera of which the larvæ are known, tabulated by their larvæ: the *Histeridæ* are assuredly useful, from their devouring phytophagous insects. É. Perris, Ann. Soc. L. Lyon (n.s.), xxii. pp. 283 & 284. *Abræus globosus*, p. 272, figs. 9–12 (observations also on commensal larvæ), *Hister 12-striatus*, p. 277 (and pupa), *H. 4-maculatus* and *Saprinus rotundatus*, p. 279, *Teretrius picipes*, p. 280; larvæ described, *id. l. c.*

Species taken by C. van Volxem in Portugal, Tangiers, Brazil, and the Argentine States; S. A. de Marseul, CR. Ent. Belg. xx. pp. ii. & iii.

Hister (Pactolinus) jamatus, Mots., = *jekeli*, Mars.; E. v. Harold, Deutsche E. Z. 1877, p. 345.

Heterius pluristriatus and *lioderus*, Algeria, *arachnoides*, Morocco, spp. nn., L. Fairmaire, Pet. Nouv. ii. p. 98.

Saprinus revisus and *biskrensis*, Algeria, *arachidarum*, Marseilles, and *persanus*, N. Persia, spp. nn. [? De Marseul], Nouv. et faits (2), No. 10, p. 39.

Teretrius pulex, sp. n., Fairmaire, *l. c.* p. 141, Tougourt, N. Africa.

Plegoderus marseuli, E. Reitter, Deutsche E. Z. 1877, p. 371, Japan; *P. adonis* [? De Marseul], Nouv. et faits (2), No. 10, p. 40, Cyprus: spp. nn.

Abræus raddii, Reitter, *l. c.* p. 292, Tiflis; *A. punctatissimus*, *id.* Verh. Ver. Brünn, xv. p. 15, pl. i. fig. 6, Transsylvanian Alps: spp. nn.

Acritus microscopicus, sp. n., Reitter, Verh. Ver. Brünn, xv. p. 16, Transsylvanian Alps (table of known species, p. 17; cf. De Marseul, Nouv. et faits, 1877, p. cxxx.).

Myrmidius irregularis, sp. n., Reitter, Verh. z.-b. Wien, xxvii. p. 165, Teapa.

NITIDULIDÆ.

E. Reitter, Deutsche E. Z. 1877, p. 180, gives various synonymic notes, whereof some are apparently mere guesses. *Strongylomorphus*, Reitt., nec Mots., is renamed *Cyllodesus*.

Soronia grisea, p. 284, *Rhizophagus nitidulus*, p. 286 (and pupa), figs. 13–16, *R. dispar*, p. 305, fig. 35, *Pria dulcamarae*, p. 289 (and pupa), figs. 17–22, *Brachypterus vestitus*, Kies., *cinereus*, Heer, and *linariae*, Corn., p. 293 (and pupa), figs. 23–26, *B. urticae*, p. 295, *Cercus rufilabris*, p. 296, fig. 27, *Meligethes viridescens*, p. 297, fig. 28, *M. marrubii*, Bris., p. 298, *Nitidula 4-pustulata*, p. 300, *Ips 4-punctata*, p. 301, figs. 29–32, *Carpophilus hemipterus*, p. 303 (and pupa), figs. 33 & 34, larvæ described, with general observations on those of the family, which appear to have the special attribute of pupating in the ground. É. Perris, Ann. Soc. L. Lyon (n.s.) xxii.

Brachypterus metallescens, Schauf., = *pallipes*, Murray; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

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New genera and species :—

Erimodes, Reitter, Verh. z.-b. Wien, xxvii. [for 1877, but published in 1878], p. 167. In the first group, with simple prosternum, next before *Perilopa*. *E. synchitoides* and *fuscitarsis*, *ibid.*, Chili.

Hapalips, *id.*, Verh. Ver. Brünn, xv. p. 122. In the author's *Rhizophagide*, between *Ips* and *Rhizophagus*, with the tarsal structure of *Languria* (4-jointed), and also approaching the *Cucujidae* and *Cryptophagide*. For *H. grandis*, pl. ii. fig. 1, *tenuis* and *filum*, p. 125, *gracilicornis*, p. 126, fig. 2, and *laticollis*, p. 127, fig. 3, Colombia, *semifuscus* and *nigriceps*, p. 126, and *fuscus*, p. 127, Brazil, *brevicornis*, p. 127, Parahyba, and *mexicanus*, p. 127, figs. 4 a & b, Mexico, *id. l. c.*

Lenax, D. Sharp, Ent. M. M. xiii. p. 269. Near *Rhizophagus*. *L. mirandus*, *ibid.*, Canterbury, New Zealand.

Heterohelus heterostomoides, Reitter, Deutsche E. Z. 1877, p. 371, Japan.

Amartus (*Heterohelus*) *morio* and *japonicus*, p. 166, *augusticollis*, p. 167, *id.* Verh. z.-b. Wien, xxvii., Japan.

Carpophilus punctatissimus, *id.* Deutsche E. Z. 1877, p. 372, Japan.

Brachypeplus (*Tasmus*) *haagi*, *id.* Verh. z.-b. Wien, xxvii. p. 165, Queensland.

Conotelus parvulus, *id. l. c.* p. 166, Bogota.

Epuræa hilleri, *id.* Deutsche E. Z. 1877, p. 109, Japan.

Haptoncúra [misprinted *Haptoneura*, Zool. Rec. xii. pp. 307 & 587], *subquadrata*, p. 22, Cape York, *imperialis*, p. 128, Australia, *id.* MT. Münch. ent. Ver. i.

Omosiphora georgica, *id.* Deutsche E. Z. 1877, p. 296, Caucasus.

Soronia hilleri, *id. l. c.* p. 109, Japan.

Stelidota multiguttata and *dilatimana*, *id. l. c.* p. 110, Japan.

Meligethes floribundus, p. 293, Caucasus, *haroldi*, p. 372, Japan, *id. l. c.*

Hebascus japonus, p. 372, *hilleri*, p. 373, *id. l. c.* Japan.

Strongylus dubius, *id. l. c.* p. 374, Japan, *ruber*, *id.* Verh. z.-b. Wien, xxvii. p. 170, Bogota.

Lasiodactylus attenuatus, *id.* Verh. z.-b. Wien, xxvii. p. 169, Dorey.

Camptodes trilineatus, p. 169, Brazil, *adustulus*, p. 170, Mexico, *id. l. c.*

Amphicrossus punctatulus, *id. l. c.* p. 170, Sarawak.

Pallodes hilleri, *id.* Deutsche E. Z. 1877, p. 374, Japan.

Adocimus dimidiatus, *id.* MT. Münch. ent. Ver. i. p. 127, New Guinea.

Cryptarcha uniformis, *id.* Verh. z.-b. Wien, xxvii. p. 171, Bogota, *maculosa*, Chili, and *nitida*, Adelaide, *id.* MT. Münch. ent. Ver. i. p. 129.

Ips janthinus, *id.* MT. Münch. ent. Ver. i. p. 130, Tasmania.

Ipsimorpha schauvi, Colombia, *scribeæ*, Venezuela, *id.* Verh. z.-b. Wien, xxvii. p. 171, *ruficapilla*, *id.* MT. Münch. ent. Ver. i. p. 130, Mexico.

Pityophagus quercus, *id.* Verh. Ver. Brünn, xv. p. 17, pl. i. fig. 7, Szombatsag, South Hungary.

TROGOSITIDÆ.

Trogosita (*Temnochila*) *pini*, Brullé, = *cerulea*; *T. pini*, Reitt., nec Brullé, ? = *mexicana*, Reitt., var.; *Leperina turbata*, Pasc., is a good

species, and has nothing to do with *signoreti*, Montr.; A. Léveillé, Bull. Soc. Ent. Fr. (5) vii. p. cxii. *T. pini*, Reitt., = *metallica*, Perch.; Sallé, tom. cit. p. cxliii.

Trogosita mauritanica. Erichson's description of the larva amended; É. Perris, Ann. Soc. L. Lyon (u.s.) xxii. p. 308.

Promanus, g. n., D. Sharp, Ent. M. M. xiii. p. 267. Near *Ostoma*. *P. depressus*, sp. n., *id.* l. c. p. 266, New Zealand.

Grynoma, g. n., *id.* l. c. p. 267. Between *Pelonyxa* and *Neaspis*. *G. fusca* and *diluta*, spp. nn., *id. ibid.*, New Zealand.

Pelostoma, g. n., E. Reitter, Verh. z.-b. Wien, xxvii. [for 1877, published in 1878], p. 173. Facies of *Micropeltis*, but with 10-jointed antennæ, and to be placed between *Ancyrona* and *Leptonyxa*. *P. unguicularis*, sp. n., *id.* l. c. p. 174, Chili.

Ostomodes, g. n., *id.* l. c. p. 174. Very near *Micropeltis*, but with simple claws, and closely foveolate-punctate. *O. dohrni*, sp. n., *id. ibid.*, California.

Grynocharina, g. n., *id.* MT. Münch. ent. Ver. i. p. 131. Build of *Ostoma*, but with 9-jointed antennæ and 2-jointed club. Near *Peltonyxa*, Reitt., but with prominent mandibles, simple tarsi, indistinctly toothed claws, &c. *G. peltiformis*, sp. n., p. 132, East India.

Ærora aequalis, sp. n., *id.* Verh. z.-b. Wien, xxvii. p. 172, California.

Tenebrionoides lineolata, sp. n., *id. ibid.*, Colombia.

Leperina wakefieldi, p. 191, *farinosa*, p. 266, D. Sharp, Ent. M. M. xiii. New Zealand, spp. nn.

Ancyrona extensa, Reitter, l. c. p. 173, Bogota, *haroldi*, *id.* Deutsche E. Z. 1877, p. 375, Japan: spp. nn.

Micropeltis inæqualis, *id.* Verh. z.-b. Wien, xxvii. p. 175, *flavo-limbata*, *id.* MT. Münch. ent. Ver. i. p. 23, Chili: spp. nn.

Nosodes spinifera, sp. n., *id.* Verh. z.-b. Wien, xxvii. p. 175, Cape of Good Hope.

Latolæva quadrinaculata, sp. n., *id.* MT. Münch. ent. Ver. i. p. 131, Malacca.

Thymalus aubæi, sp. n., A. Léveillé, Bull. Soc. Ent. Fr. (5) vii. p. cxi. Batum.

COLYDIIDÆ.

Endophlæus spinosulus, p. 309, figs. 36-40, and *Colobicus emarginatus*, p. 312, figs. 41 & 42, larvæ described; É. Perris, Ann. Soc. L. Lyon (n.s.) xxii.

Epistrophus, Shp., nec Kirsch, renamed *Epistranus*; D. Sharp, Ann. N. H. (4) xix. p. 120.

Thyreosoma, Chev., = *Discoloma*, Er.; *D. parmula*, Chev., is a *Philothermus*; *D. parmula*, Pasc., = *T. circulare*, Chev. The known species tabulated; E. Reitter, Deutsche E. Z. 1877, p. 176.

Cossyphodes wollastoni, Westw., in St. Helena, with the ant *Æcoph-thora pusilla*, possibly introduced; T. V. Wollaston, Col. St. Hel. p. 239.

New genera and species :—

Anisopaulax, Reitter, S. E. Z. xxxviii. p. 324. *Synchitini*: antennæ 10-jointed, with 3-jointed club; thorax transversely quadrate, longitudinally and transversely sulcate, subconstricted in the middle. *A. brucki*, *ibid.*, Mexico.

Pseudaulonium, *id. l. c.* p. 334. Allied to *Aulonium* and *Ocholissa*, differing from the former in the simple tibia, thoracic sculpture, &c., and from the latter in the longer tarsi, &c. *P. regale*, p. 335, Colombia, *ferrugineum*, p. 336, Brazil.

Serrotibia, *id. l. c.* p. 339. Allied to *Nematidium*, but with first tarsal joint much shorter; between that genus and *Teredus*. *S. cucujiformis*, p. 340, and *bicolor*, p. 341, Colombia, *unicolor*, p. 341, Peru.

Ulonotus discedens and *integer*, D. Sharp, Ent. M. M. xiii. p. 268, New Zealand.

Endophleus sharpi, Reitter, S. E. Z. xxxviii. p. 323, Chili.

Colobicus uniformis, *id. MT. Münch. ent. Ver. i.* p. 132, E. India.

Phlæodalis erichsoni, *id. l. c.* p. 133, Vera Cruz.

Holopleuridia imperialis, *id. S. E. Z. xxxviii.* p. 325, Cape York.

Phormesa sharpi, *id. l. c.* p. 326, Mysol.

Synchitodes frivaldskii, *id. ibid.*, Syria.

Trachypholis deyrollii, p. 327, Malacca, *erichsoni*, Siam, *fasciculata*, Ceylon, p. 328, *id. l. c.*

Cebia scabrosa, *id. l. c.* p. 329, Cape York.

Illestus repandus, *id. l. c.* p. 329, Cape York, *grouvellii*, p. 133, and *proeductus*, p. 134, Australia, *id. MT. Münch. ent. Ver. i.*

Phlæonemus interruptus, p. 330, Mexico, *integer*, p. 331, locality unknown, *id. S. E. Z. xxxviii.*

Distaphyla setosa, *id. l. c.* p. 331, Sumatra.

Acropis steinheili, p. 332, *discoidea* and *tristis*, p. 333, *id. l. c.*, Colombia.

Aulonium insigne, *id. l. c.* p. 336, Colombia.

Colydidium pascoei, *id. MT. Münch. ent. Ver. i.* p. 23, Colombia.

Endestes (from which *Gempylodes*, Pasc., is not separable) *sulcicollis*, *id. S. E. Z. xxxviii.* p. 337, Brazil.

Deretaphrus granulipennis, *id. l. c.* p. 342, New S. Wales.

Anarmostes costicollis, *id. l. c.* p. 342, Colombia.

Sosylus lineolatus, p. 343, America, *trilineatus*, p. 344, Colombia, *id. l. c.*

Prolyctus costipennis, p. 345, Colombia, *haagi*, La Plata, and *dorsalis*, Mexico, p. 346, *gemmatus*, p. 347, San Domingo, *id. l. c.*

Bothrideres bituberculatus, p. 347, Ceylon, *foveicollis*, p. 348, Cape of Good Hope, *id. l. c.*

Dastarcus decorus, *id. l. c.* p. 349, New Guinea, Cape York, Malacca.

Penthelispa crassicornis and *alternans*, p. 349, *nitidicollis*, p. 350, Ceylon, *robusta*, p. 350, *areolata*, p. 351, and *puncticollis*, p. 352, Colombia, *corpulenta*, p. 351, ? S. America, *id. l. c.*; *P. longicollis*, *id. MT. Münch. ent. Ver. i.* p. 23, Malacca.

Enarsus wakefieldi, p. 190, *rudis*, p. 191, D. Sharp, Ent. M. M. xiii., New Zealand.

Pycnomerus bi-impressus, Reitter, S. E. Z. xxxviii. p. 355, Porto Rico.

Philothermus latus, *id. ibid.*, Bogotá.

Cerylon evanescens, id. Verh. Ver. Brünn, xv. p. 20, Transsylvanian Alps; *C. spissicorne*, L. Fairmaire, Bull. Soc. Ent. Fr. (5) vii. p. lxvi., Constantinople.

Discoloma erichsoni (parmula, Er., M.S.), Reitter, Deutsche E. Z. 1877, p. 176, Cuba.

CUCUJIDÆ.

A. Grouvelle, Ann. Soc. Ent. Fr. (5) vii. pp. 204-214, pl. v., continues his descriptions of new or little known species. *Platamus deyrollei*, Gr., fig. 1, *schaumi*, Gr., fig. 2, *Telephanus americanus*, Ol., fig. 3, *Læmophleus curtus*, Gr., fig. 7, *reitteri*, Gr., fig. 8, *impressus*, Gr., fig. 10, *turcicus*, Gr., fig. 11, are fully described and figured.

Brontes planatus, p. 315, *Læmophleus testaceus*, p. 317 (and pupa), figs. 43-45, *Dendrophagus crenatus*, p. 318, *Lathropus sepicola*, p. 320 (and pupa), figs. 46-53, *Silvanus unidentatus* and *Cathartus advena*, p. 323, larvæ described; É. Perris, Ann. Soc. L. Lyon (n.s.), xxii.

Platamus and *Telephanus*. E. Reitter, MT. Münch. ent. Ver. i. p. 7, criticizes Schaufuss's species [Zool. Rec. xiii. Ins. p. 49]. All the *Platami* of Schaufuss belong to *Telephanus*; *T. lateralis*, Sch., ? = *pilicornis*, Reitt. *T. pallidus*, Rt., = *P. ? pallidulus*, Chevr.; id. Deutsche E. Z. 1877, p. 191.

Schedarosus, Reitt., = *Sitophagus*, Muls. [a Tenebrionid]; id. MT. Münch. ent. Ver. i. p. 8.

New genera and species:—

Bessaphilus, C. O. Waterhouse, Ent. M. M. xiv. p. 26. *Prostomis*, with the head of *Cucujus*. *B. cephalotes*, p. 27, Tasmania.

Platamops, Reitter, Verh. z.-b. Wien, xxvii. [for 1877, but published in 1878], p. 177. Allied to *Parabrontes* and *Platamus*, but with short basal joint to antennæ and simple 5-jointed tarsi. *P. decoratus*, p. 177, and *vittatus*, p. 178, Colombia.

Amydropa, id. l. c. p. 179. Allied to *Æraphilus* and *Hypocoprus*, both of which are referred to the *Cucujidæ* (the *Cryptophagidæ* being specialized by a distinctly long basal abdominal segment). No eyes, pygidium covered. *A. anophthalma*, p. 180, Chili.

Passandra marginata, A. Grouvelle, Bull. Soc. Ent. Fr. (5) vii. p. clix, Australia.

Hectarthrum raffrayi, id. R. Z. (3) v. p. 296, pl. i. fig. 10, Abyssinia.

Catogenus planus, Reitter, Verh. z.-b. Wien, xxvii. p. 176, Mexico.

Ancistria fabricii, id. MT. Münch. ent. Ver. i. p. 134, E. India.

Prostomis atkinsoni, Tasmania, *cornutus*, S. Australia, C. O. Waterhouse, l. c. p. 26.

Cucujus grouvelli, Reitter, MT. Münch. ent. Ver. i. p. 24, Himalaya.

Brontes atratus, id. *ibid.*, Malacca; *B. (P g. n.) pleuralis*, D. Sharp, Ent. M. M. xiii. p. 270, Tairua, New Zealand.

Platamus humeralis, Reitter, Verh. z.-b. Wien, xxvii. p. 176, Colombia; *P. buqueti*, Grouvelle, Bull. Soc. Ent. Fr. (5) vii. p. 1, Cayenne.

Telephanus acuminatus, Chili, *agilis*, Mexico, *pubescens*, Nicaragua, id.

l. c. p. lviii.; *T. apicalis*, p. 207, fig. 4, Cuba, *cruz*, p. 208, fig. 5, Mexico, *id. tom. cit. (Ann.)*.

Leomophleus albo-fasciatus, Caracas, *tuberculatus*, Australia, p. 1., *contaminatus*, p. clix., Australia, *id. tom. cit. (Bull.)*; *L. elegans*, p. 208, fig. 6, *lacerdæ*, p. 211, fig. 9, Brazil, *convexiusculus*, p. 213, fig. 12, Japan, *id. tom. cit. (Ann.)*; *L. curtipennis*, p. 297, fig. 9, and *brunneus*, p. 298, fig. 11, Zanzibar, *id. R. Z. (3) v. pl. i.*; *L. carinulatus*, T. V. Wollaston, Col. St. Hel. p. 44, St. Helena; *L. hilleri*, Reitter, Verh. z.-b. Wien, xxvii. p. 176, Japan.

Æraphilus seminiger, fig. 7, and *fallax*, fig. 8, Grouvelle, R. Z. (3) v. p. 296, pl. i. Abyssinia.

Psammæus brevisculus, Reitter, *l. c. p. 178*, Dorey.

Myrabolia grouvelliana, *id. l. c. p. 179*, Tasmania.

Hypocopræ quadricollis, *id. l. c. p. 181*, Sos, S. France.

Silvanus atratulus, Grouvelle, Bull. Soc. Ent. Fr. (5) vii. p. clix. Australia.

CRYPTOPHAGIDÆ.

Telmatophilus brevicollis, p. 326 (and pupa), figs. 54-58, decidedly phytophagous, *Antherophagus silaceus*, Hbst., p. 331, parasitic on *Bombus*; larvæ described, E. Perris, Ann. Soc. L. Lyon (n.s.), xxii.

Cryptophagus californicus, Mann., = *Henoticus serratus*, Gyll.; *C. depressus*, Reitt., is in error for *subdepressus*, Gyll.; *Cnecophagus jekeli*, Rt., is an *Engis*; *Cryptophilus glisonothoides*, Rt., is referred to *Tomarus*; *Atomaria umbrina*, Er., *plicicollis*, Mäkl., = *fuscicollis*, Mann. [in spite of the non-existent "elytris antærius confuse strigulosus" of the latter]; *A. abeillii*, Tourn., ex. typ., = *finetarii*, Hbst.; *A. amplipennis*, Rt., = *plicata*, var.; *A. delicatula*, Tourn., a good species; with some problematical synonymy. E. Reitter, Deutsche E. Z. 1877, pp. 190 & 191.

Cryptophagus angustatus and *laticollis*, Luc., ex. typ.; *C. puncticollis*, Luc., = *pilosus*, Gyll.; *C. p. gibberosus*, Luc., is *Symbiotes pygmæus*, Hampe, which was subsequently described; *C. p. maurus*, Luc., is an *Orestia* [!], probably *O. pommereau*, Perris. L. Bedel, Bull. Soc. Ent. Fr. (5) vii. pp. xviii. & xix.

Atomaria linearis. Notes on economy; Von Schönfeldt (Weiner landwirthschaftliche Zeitung, 1877, No. 21), Ent. Nachr. iii. p. 167.

Henotiderus, g. n., Reitter, MT. Münch. ent. Ver. i. p. 25. Facies of *Atomaria*, but with long pubescence, and antennæ lateral. Allied to *Henoticus* and also to *Thallectus*. *Henotid. centro-maculatus*, sp. n., p. 26, Japan.

Thallectus dohrni, p. 136, *liliputanus* and *obscurus*, p. 137, *brunnescens*, p. 138, *id. l. c.*, E. India; *T. wollastoni*, p. 184, *convexus*, p. 185, Ceylon, *subfasciatus*, p. 185, Mexico, *id. Verh. z.-b. Wien*, xxvii.: spp. nn.

Cryptophagus quadrimaculatus, *id. Deutsche E. Z. 1877*, p. 294, Caucasus; *C. reflexicollis*, *id. Verh. Ver. Brünn*, xv. p. 21, Transsylvanian Alps: spp. nn.

Paramecosoma univestre [sic], sp. n., *id. Deutsche E. Z. 1877*, p. 294, Caucasus, Prague, Hamburg, Vienna.

Atomaria pilifera, p. 111, *punctatissima*, and *A. (Anchicera) lewisi* and *horridula*, p. 112, spp. nn., *id. l. c.* Japan.

Ephistenus [sic] *japonicus*, sp. n., *id. Verh. z.-b. Wien*, xxvii. p. 181, Japan.

LATHRIDIIDÆ.

Merophysia, *Coluocera*, and *Reitteria*. E. Reitter, MT. Münch. ent. Ver. i. pp. 1-6, criticizes Schaufuss's notes [Zool. Rec. xiii. Ins. p. 51], and re-tabulates these genera. *Coluocera gallica*, Sch., = *formicaria*, Mots.; *C. formicicola*, Sch., = *punctata*, Mkl.; *Merophysia minor*, Baudi, ex. typ., = *carmelitana*, Sauley.

Langelandia anophthalma, Aubé, p. 335 (and pupa), figs. 59-61, *Corticaria gibbosa*, p. 338, figs. 62-64, larvæ described, with pupa of *C. serrata*, p. 340; Perris, Ann. Soc. L. Lyon (n.s.), xxii.

Hyp[oc] lathrinus, g. n., Reitter, Verh. z.-b. Wien, xxvii. [for 1877, published in 1878], p. 181. Between *Holoparamesus* and *Abromus*, and very near the former, wanting however the semicircular blackish frontal linear impression, and having ten-jointed antennæ, of which the two basal joints are enlarged, and the club abruptly tri-articulate, &c. *H. planicollis*, sp. n., p. 182, Mendoza.

Merophysia bauduieri, sp. n., *id. MT. Münch. ent. Ver. i. p. 6*, Algiers.

Holoparamesus (Calyptribium) lederi, sp. n., *id. Deutsche E. Z.* 1877, p. 295, Caucasus.

Anommatus baudii, sp. n., *id. MT. Münch. ent. Ver. i. p. 27*, Turin.

Corticæus cylindricus, sp. n., *id. l. c. p. 27*, Fiji.

Langelandia grandis, sp. n., *id. Deutsche E. Z.* 1877, p. 296, Caucasus.

Metopthalmus plicatulus, sp. n., *id. Verh. z.-b. Wien*, xxvii. p. 182, Bogota.

Lathridius chinensis, *id. Deutsche E. Z.* 1877, p. 113, China and Japan; *L. (Latridulus) approximatus*, T. V. Wollaston, Col. St. Hel. p. 52, St. Helena: spp. nn.

Coninomus bifasciatus, Reitter, MT. Münch. ent. Ver. i. p. 138, Australia; *C. subfasciatus*, *id. Verh. z.-b. Wien*, xxvii. p. 183, Chili: spp. nn.

Cartodere bicostata, *id. ibid.*, Mexico (where *C. filum*, Aubé, also occurs); *C. costipennis* and *costulata*, *æqualis*, p. 295, Caucasus, *id. Deutsche E. Z.* 1877, p. 114, Japan: spp. nn.

Corticaria ornata, p. 115, and *japonica*, p. 116, China and Japan, *fasciata*, p. 115, Japan, *id. Deutsche E. Z.* 1877; *C. subtilissima*, *id. MT. Münch. ent. Ver. i. p. 139*, Australia: spp. nn.

Migneauxia orientalis, sp. n., *id. MT. Münch. ent. Ver. i. p. 139*, E. India.

Myrmecoxenus (referred to the *Mycetophagidæ*) *calvus*, sp. n., *id. Verh. z.-b. Wien*, xxvii. p. 184, Celebes.

MYCETOPHAGIDÆ.

Litargus bifasciatus, p. 342, figs. 65-71, *Mycetophagus piceus*, p. 345, and *Typhæa fumata*, p. 347, larvæ and pupæ described; E. Perris, Ann. Soc. L. Lyon (n.s.), xxii.

Atritomus, g. n., Reitter, Deutsche E. Z. 1877, p. 384. *Tritomides* (European genera tabulated); differing from *Triphyllus* in its moderately small, prominent, round eyes, its antennæ being only gradually thickened towards the apex, and its striato-punctate elytra. Its round eyes and the want of a basal thoracic groove distinguish it from *Tritoma*, and its less decided antennal club from *Litargus*, &c. For *Triphyllus cribratus*, Baudi (Sardinia).

Triphyllina, g. n., Reitter, l. c.; allied to the preceding, but with distinct three-jointed club, elytra not punctate-striate, very small round eyes, and prosternum sharply carinate. No type mentioned, but founded on an insect from the Caucasus.

Mycetophagus hillerianus, sp. n., *id.* l. c. p. 116, Japan.

Litargus japonicus, sp. n., *id.* MT. Münch. ent. Ver. i. p. 27, Japan.

Diplocælus grandis and *haagi*, p. 186, Mexico, *foveolatus* and *tessellatus*, p. 187, Chili, *mus*, ? West Indies, *amplicollis*, Rio Janeiro, Colombia, p. 188, *oblongus*, Brazil, *philothermoides*, N. America, p. 189 (table of the known species, pp. 190 & 191), Reitter, Verh. z.-b. Wien, xxvii., spp. nn.

DERMESTIDÆ.

Dermestes vulpinus damaging dried hides from China to the extent of 15 to 20 per cent. on value of cargo; the larvæ also riddled a wooden case containing the hides: W. L. Distant, P. E. Soc. 1877, p. xxii. *D. vulpinus* and *frischi* perforating linen in Algeria; L. Bedel, Bull. Soc. Ent. Fr. (5), vii. p. xi. *D. vulpinus*, var. n. *sudanicus*, P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 506, Khartum.

Anthrenus pimpinillæ, var. n. *cinnamomeus*, Gredler, l. c. p. 507, Khartum.

Byturus. On variation, &c., in the European species; E. Reitter, Ent. Nachr. iii. p. 69.

Dermestes coarctatus, sp. n., E. v. Harold, Deutsche E. Z. 1877, p. 347, Nagasaki.

Attagenus japonicus, sp. n., Reitter, Deutsche E. Z. 1877, p. 375, Japan.

Trogoderma serrigerum, p. 270, *signatum*, p. 271, spp. nn., D. Sharp, Ent. M. M. xiii., New Zealand.

Trinodes rufescens, sp. n., Reitter, l. c. p. 376, Japan.

BYRRHIDÆ.

Limnichus and *Pelochares* revised by J. Weise, Deutsche E. Z. 1877, pp. 299–302. *P. emarginatus*, Rey, = *versicolor*, Walk.; *L. punctipennis*, Baudi, nec Ktz., renamed *inornatus*, p. 301.

Limnichus angustulus, p. 300, Sardinia, *lederi*, p. 301, Caucasus, spp. nn., *id.* l. c.

PARNIDÆ.

Parnus striatellus, Fairm., from Britain; G. Lewis, Ent. M. M. xiv. p. 70. This species = *algericus*, Luc.; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xix.

Dryops (Parnus) corpulentus, sp. n., E. Reitter, Verh. z.-b. Wien, xxvii. p. 191, Mendoza.

Pomatinus angusticollis, sp. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 141, New Zealand.

LUCANIDÆ.

Dorcus nitidus, sp. n., T. Kirsch, MT. Mus. Dresd. Heft. ii. p. 138, New Guinea.

Gnaphaloryx curtus, sp. n., *id. ibid.*, New Guinea.

Cyclommatus margarite, sp. n., R. Gestro, Ann. Mus. Genov. ix. p. 324 (figs., and fig. of head of *C. kaupi*, p. 325), Fly River, New Guinea.

Trichostigmus glaber, sp. n., T. Kirsch, MT. Mus. Dresd. ii. p. 139, Jobi.

Mastochilus obliquus, sp. n., *id. l. c.* p. 140, Jobi.

SCARABÆIDÆ.

Analytical table and general characters of the known larvæ; E. Perris, Ann. Soc. L. Lyon (n.s.), xxii. pp. 349-365, including *Lucanidæ*. Observations on those found in the chestnut-tree, p. 363, figs. 149-169 (details).

D. Sharp, J. L. S. xiii. pp. 129-138, describes various species taken by T. Belt in Nicaragua: about 150 species in all were found, including probably 50 undescribed.

E. v. Harold, Ann. Mus. Genov. x. pp. 38-110, describes coprophagous Lamellicorns found in the Malay Archipelago, New Guinea, and North Australia, by Doria, Beccari, and d'Albertis. Three new genera and many new species are characterized.

Coprides.

Copris lunaris, p. 365, figs. 72-81, and *Onthophagus nuchicornis*, p. 367, figs. 82-84, larvæ described; Perris, *l. c.*

Onthophagus taurus, L. (1767), = *rugosus*, Poda (1761), = *taurus*, Schreber (1759); *O. rugosus*, Kby., renamed *tenebrosus* by Harold, therefore stands. E. v. Harold, Münch. ent. Ver. i. p. 117.

Gymnopleurus dubius, Shp., = *calcar*, Shp., ♀, and the form of the apical spur is not specific; *Coptodactyla*, Burm., and *Cyobius*, Shp., are referred to the *Cheridiides*. Id. Ann. Mus. Genov. x. pp. 39, 41, 42.

New genera and species:—

Paraphytus, *id. l. c.* p. 42. Between *Scatonomus* and *Cheridium*; posterior tarsi with all the joints as long as broad, metathoracic episterna very narrow, elytral epipleuræ rather wide and concave in front. *P. doriae*, p. 43, Sarawak.

Saphobius wakefieldi, D. Sharp, Ent. M. M. xiii. p. 192, New Zealand.

Macroderes nitidus, Harold, MT. Münch. ent. Ver. i. p. 97, Cape of Good Hope.

Catharsius pandion, *harpagus*, and *camillus*, p. 97, South Africa, *coronatus*, p. 98, Ceylon, *id. l. c.*

Sisyphus tibialis, A. Raffray, R. Z. (3) v. p. 312, pl. i. figs. 6 & 6 A, Abyssinia.

Pedaria armata and *dentata*, id. l. c. p. 313, Zanzibar.

Copris servius, p. 46, and *doriae*, p. 49, Sarawak, *claudius*, p. 48, Ceylon, *confucius*, ibid. note, Hong Kong, Harold, Ann. Mus. Genov. x.; *C. sphaeropterus*, id. MT. Münch. ent. Ver. i., p. 98, Cape of Good Hope.

Coptodactyla subanea, id. Ann. Mus. Genov. x. p. 41, Cape York.

Phanaeus mirabilis, id. MT. Münch. ent. Ver. i. p. 98, Brazil.

Onthophagus dives, p. 98, *lacustris*, p. 99, Lake Nyassa, *kindermanni*, Rumelia or tropical Asia, and *noctivagus*, Egypt, p. 99, id. l. c.; *O. incisus*, p. 52, *rorarius* (? = *incisus*, var.) and *ochromerus*, p. 53, *vulpes*, p. 54, *pavidus*, p. 55, *infucatus*, p. 56, *borneensis*, p. 57, *foveolatus*, p. 68, *diabolicus*, p. 78, *sarawacus*, p. 79, *aurifex*, p. 80, *semicupreus*, p. 81, Sarawak, *gestroi*, p. 59, Celebes, Sumatra, *ceylonicus*, p. 61, Ceylon, *papuensis* and *signifer*, p. 65, *tetricus*, p. 70, *albertsi*, p. 71, *doriae*, p. 76, New Guinea, *scrutator*, p. 66, *holosericus*, p. 69, Celebes, *carinulatus*, p. 69, Ternate, *latro*, p. 74, *villis* and *ocelliger*, p. 75, Cape York, *egenus*, p. 82, Java, *nitefactus*, p. 83, Aru Isles, id. Ann. Mus. Genov. x.; *O. finschi*, p. 333, *zibricus*, p. 335, Lepsa or Lepsinok, at the foot of the Ala-Tau, id. Deutsche E. Z. 1877; *O. tapirus*, Sharp, J. L. S. xiii. p. 130, Nicaragua; *O. deyrollii*, p. 315, fig. 1, *planiceps*, p. 316, fig. 4, *quadrimaculatus* and *mucronatus*, (figs. 5 & 5 a), p. 319, *simplex* and *exiguus*, p. 320, *convexifrons*, p. 321, *infuscatus*, p. 322, *delicatulus* and *gemellatus*, p. 324, *carinicollis*, p. 325, figs. 2 & 2 a, Zanzibar, Bagamoyo, &c., *gracilicornis*, p. 316, fig. 3, *tubericollis*, p. 317, *nigriceps* and *alternans*, p. 318, *fallaciosus*, p. 321, *humeralis*, p. 322, *frontalis* and *interruptus*, p. 323, *bicolor*, p. 324, Abyssinia, Raffray, l. c. pl. i.

Caccobius binodulus, Harold, Ann. Mus. Genov. x. p. 50, Sarawak; *C. microcephalus*, id. Deutsche E. Z. 1877, p. 349, Tokio.

Drepanocerus (?) *parallelus*, Abyssinia, and *D. setiger*, Zanzibar, Raffray, l. c. p. 314.

Aphodiides.

None of the species observed in New Zealand are coprophagous, but all are found under stones and logs; T. Broun, Tr. N. Z. Inst. x. p. 553.

The Argentine States species described by H. Burmeister, S. E. Z. xxxviii. pp. 401-414. *Atenius* is considered not separable from *Euparia*.

Oxyomus exsculptus, White, *Aphodius suspectus*, *distans*, and *brouni*, Shp., referred to *Saprosites*; E. v. Harold, Ann. Mus. Genov. x. p. 92. *A. diversus*, C. O. Wat., = *solskii*, Har.; id. Deutsche E. Z. 1877, p. 350.

Aphodius fossor; larva described by E. Perris, l. c. p. 367, figs. 85-92.

Odochilus, g. n., Harold, Ann. Mus. Genov. x. p. 97. Has affinities with *Rhyssenus*, *Euparia*, *Atenius*, and even *Trox*: placed near *Euparia*. No connection with *Antrixis*, Pasc., which seems near *Rhypparus* in the *Coprides*. For *O. syntheticus*, sp. n., Harold, l. c. p. 99, fig. p. 100, Celebes, Borneo.

Aulonocnemis (not properly belonging to the *Coprides*, but placed near *Atenius*) *monstrosa*, sp. n., id. l. c. p. 92, Borneo.

Aphodius amarchicus, p. 325, *plagiatus* and *foveiventris*, p. 326, A. Raffray, R. Z. (3) v. Abyssinia; *A. scoparius*, Harold, MT. Münch. ent.

Ver. i. p. 112, Kiakhtha ; *A. albertisi*, id. Ann. Mus. Genov. x. p. 86, Cape York : spp. nn.

Ammæcius gestroi, sp. n., Harold, Ann. Mus. Genov. x. p. 87, Celebes.

Oxyomus debilis, sp. n., id. l. c. p. 88, Celebes.

Suprosites marchionalis, p. 89, *laeviceps*, p. 90, *difficilis*, p. 91, Borneo, *pygmaeus*, p. 91, Key Islands, spp. nn., id. l. c.

Euparia pusilla, p. 410, *cribricollis* and *luctuosa*, p. 411, spp. nn., H. Burmeister, S. E. Z. xxxviii., La Plata.

Atenius spinator, p. 94, *granulator*, p. 95, New Guinea, *peregrinator*, p. 96, Celebes, Borneo, spp. nn., Harold, l. c.

Psammobius indicus, sp. n., id. l. c. p. 100, Celebes.

Orphnides.

Hybalus granicornis, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 141, Batna.

Geotrupides.

Bolboceras albertisi, sp. n., Harold, Ann. Mus. Genov. x. p. 103, fig., Cape York (*B. rhinoceros*, McL., described for comparison).

Pleocomides.

Plecoma. The structure of the mandibles in the larva found after moulting to be very different from the original condition ; C. R. Osten-Sacken, Psyche, ii. p. 23.

Trogides.

Trox hispidus, larva described ; É. Perris, Ann. Soc. L. Lyon (n.s.) xxii. p. 369, figs. 93-98.

Glareis beckeri, Solsky, ♀, Krasnovodsk ; *Trox eversmanni*, Zoubk., is probably a var. of *setosus*, Fald. ; J. Faust, Horæ Ent. Ross. xii. p. 300.

Perignamptus, g. n., Harold, Ann. Mus. Genov. x. p. 106. Much resembling *Acanthocerus* (*Sphæromorphus*, Germ.), but with eyes entirely divided, and mesothoracic epimera small, narrow, not visible from above. *P. sharpi*, sp. n., p. 107, Yule Island.

Trox whiteheadi, sp. n., T. V. Wollaston, Col. St. Hel., p. 61, St. Helena.

Liparochrus raucus, *crenatus*, *asperulus*, and *aberrans*, L. Fairmaire, Pet. Nouv. ii. p. 166, Australia ; *L. quadrimaculatus*, Harold, l. c. p. 105, Cape York : spp. nn.

Melolonthides.

Apogonia nigrescens, Hope, redescribed, p. 223 ; *Anomala punctatissima*, Walk., = *Apogonia rauca*, F. (notes from *ex. typ.*), var., p. 224 ; *Trigonostoma nana*, Walk., is an *Apogonia* ; *A. brunnea*, Hope (*nec* Blanch.), = *ænescens*, Hope ; C. O. Waterhouse, Cist. Ent. ii.

Hoplia squamacea, White, and *squamigera*, Hope, redescribed ; id. l. c. p. 267.

Serica arenicola, Solsky, both sexes ; J. Faust, Horæ Ent. Ross. xii. p. 302.

Phyllopertha massageta, Solsky, colour varieties ; id. *ibid.*

Telura vitticollis, Er. The ♂ differential characters given; C. O. Waterhouse, Ann. N. H. (4) xix. p. 256.

Pachypus candidæ, Pet., p. 370, figs. 106–111, *Anozia villosa*, p. 372, fig. 118, *Amphimallus rufescens*, &c., p. 373, figs. 119–125, *Triodonta aquila*, Cast., p. 374, figs. 127–132, *Hoplia cerulea*, p. 375, figs. 135 & 136, larvæ described, with general observations on those of the group; É. Perris, Ann. Soc. L. Lyon (n.s.), xxii.

Polyphylla fullo, ♀, digging in the snow on a glacier near the Maladetta, Pyrenees; Lajoie, Bull. Soc. Ent. Fr. (5) vii. p. cxlvi. A like instance, near Caunterets; Guerrey-David, Pet. Nouv. ii. p. 107 (cf. Frey Gessner, tom. cit. p. 111).

Melolontha papposa. Note on the rare occurrence and habits of its ♀ near Gibraltar; O. Staudinger, S. E. Z. xxxviii. p. 385.

Melolontha vulgaris in February; Weyers, CR. Ent. Belg. xx. p. xiv.

Systellopides, sub-tribe n., proposed by D. Sharp, Ann. Mus. Genov. ix. pp. 311–320, to be placed at the commencement of the *Melolonthidæ*, near the *Glaphyridæ*, and differing from *Pachypus* and its Old World allies in the position and form of labrum and in the structure of the abdominal stigmata. It includes the following new genera and species:—

Sphyrocallus, p. 313. Facies of *Rhizotrogus*; upper face of labrum consisting of one part. *S. brunneus*, ibid., N.W. Australia.

Chilodiplus, p. 314. Facies of *Glaphyridæ*; labrum of the two parts. *C. albertisi*, ibid., Cape York (possibly allied to *Metascelis flexilis*, Westw.).

Systelopus, p. 315. Differs from preceding genera in its clypeus being separated from frons by a depressed suture (not a raised ridge). *S. obtusus* and *validus*, p. 316, N.W. and W. Australia.

Atholerus, p. 317. Perhaps allied to *Prochelyna heterodoxa*, Er., but with broad and large mentum; antennal club with six joints. *A. obscurus*, ibid., Swan River.

Tosotarsus, p. 318. Differs from *Systelopus* in the lesser development of the terminal joints of the antennæ, and more elongate and slender legs. *T. velutinus*, ibid., Australia.

Trichelasmus, ibid. Differs from the preceding genera in the inner faces of the antennal lamellæ being set with fine erect hairs. *T. pilicollis*, p. 319, S.W. Australia.

Enamillus, p. 319. Resembles *Trichelasmus*, but with six long antennal lamellæ. *E. striatus*, p. 320, W. Australia.

Hoplia aurantiaca, Java, *bowringi*, Penang, p. 265, *fulgida*, Malacca, *aurata*, Sarawak, p. 266, *scutellaris*, p. 268, N. China, spp. nn., Waterhouse, Cist. Ent. ii.

Camenta rubro-pilosa and *bicolor*, spp. nn., A. Raffray, R. Z. (3) v. p. 327, Zanzibar.

Mecichidius bidentulus, *bilobiceps*, and *albertisi*, spp. nn., L. Fairmaire, Pet. Nouv. ii. p. 166, Australia.

Heteronyx pumilus, sp. n., D. Sharp, Ent. M. M. xiii. p. 192, New Zealand.

Isonychus pictus, sp. n., id. J. L. S. xiii. p. 131, Nicaragua.

Faula centralis, sp. n., id. *ibid.*, Nicaragua.

Apogonia proxima, p. 223, Andaman Islands, *polita*, Siam, and *coriacea*, Ceylon, p. 225, *pallescens*, p. 227, Penang, spp. nn., C. O. Waterhouse, Cist. Ent. ii.

Lachnosterna squamuligera and *nigricollis*, spp. nn., T. Kirsch, MT. Mus. Dresd. Heft ii. p. 141, New Guinea.

Schizonycha occipitalis and *squamosa*, p. 328, *minuta*, p. 329, spp. nn., Raffray, l. c., Abyssinia.

Elaphocera insularis, sp. n., L. Fairmaire, Bull. Soc. Ent. Fr. (5) vii. p. lxxvi., Crete.

Rutelides.

Anomala rufo-cuprea, Mots., redescribed, p. 350; table of allied species, p. 356; *Rhombonyx lucidulus*, Mots., = *A. lucens*, Ballion : E. v. Harold, Deutsche E. Z. 1877.

Plusiotis. Monographic list of the 16 species found to the north of Panama; A. Boucard, P. Z. S. 1875 [omitted from Zool. Rec. xii. by a mechanical accident], pp. 117-125, pl. xxiii.

Adoretus tenuimaculatus, Waterh., = *umbrosus*, var.; Harold, l. c. p. 356.

Anomala motschulskii, p. 351, Nagasaki, *puncticollis*, p. 352, Japan, *daimiana*, p. 354, Hakodadi, Nagasaki, Harold, l. c.; *A. pygidialis*, Kirsch, l. c. p. 141, New Guinea : spp. un.

Antichira gratioa, sp. n., D. Sharp, J. L. S. xiii. p. 133, Nicaragua.

Pelidnota belti and *prolixa*, spp. nn., *id.* l. c. p. 132, Nicaragua.

Plusiotis resplendens, fig. 5, and *batesi*, fig. 6, Costa Rica, *aurora*, fig. 7, Veragua, p. 119, *lacordairii*, p. 122, fig. 4, *sallæi*, p. 123, fig. 3, *mnizechi*, p. 124, Mexico, spp. nn., Boucard, l. c. pl. xxiii.

Phalangogonia sperata and *stipes*, spp. nn., Sharp, l. c. p. 134, Central America.

Dynastides.

Chalcosoma beccarii, Gest., described and compared (figs. of head and thorax in ♂) with *C. atlas*; R. Gestro, Ann. Mus. Genov. x. pp. 641-643.

Hatamus, g. n., D. Sharp, Ann. Mus. Genov. ix. p. 321. Possibly near *Stypotrupes*, Burm. *H. tarsalis*, sp. n., p. 322, Hatam, New Guinea.

Cyclocephala conspicua and *proba*, spp. nn., *id.* J. L. S. xiii. p. 135, Nicaragua.

Temnorhynchus integriceps, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 185, New Britain.

Corynophyllus melas and *debilis*, spp. nn., *id.* Bull. Soc. Ent. Fr. (5) vii. p. cv., Australia.

Oryctoderus coronatus, H. W. Bates, P. Z. S. 1877, p. 153, pl. xxiv. fig. 5, Duke of York Island; *O. godeffroyi*, L. Fairmaire, Pet. Nouv. ii. p. 185, New Britain; *O. obtusilobis* and *gracilior*, Moluccas, *gestroi* Goram, *id.* Bull. Soc. Ent. Fr. (5) vii. p. clviii. (the latter = *albertisi* Gestro, comparatively described with figs. of head of it and *O. latitarsis*; Gestro, l. c. pp. 638-641): spp. nn.

Dipelicus nasutus, sp. n., Bates, l. c. p. 153, pl. xxiv. fig. 4, Duke of York Island.

Cryptodus oblongoporus, *neuter*, and *diffinis*, p. cxxviii., *costulipennis*, *creberrimus*, *platessa*, *rotundicollis*, *decipiens*, *fraternus*, and *cygnorum*, p. cxxix., Fairmaire, Bull. Soc. Ent. Fr. (5) vii., various Australian localities; *C. grossipes*, id. Pet. Nouv. ii. p. 166, Cleveland Bay, Australia: spp. nn.

Oetoniides.

R. GESTRO, Ann. Mus. Genov. ix. pp. 83-110, gives a supplement to his former enumeration (*op. cit.* vi. p. 487 *et seq.*) of the species collected by Doria, Beccari, and d'Albertis in the Malay Archipelago and Papuasias. One new species is described.

Lomaptera jamesi, C. O. Waterh. (Nov., 1876), = *Ischiopsopha ignipennis*, Gestro; R. Gestro, Ann. Mus. Genov. ix. pp. 91 & 92 [Gestro claims priority for his species, on the ground that his memoir is dated 28th Aug., 1876; it was published in *op. cit.* viii., for 1876, and, as the Recorder believes, not until Dec.; 1876].

Allorrhina hypoglaucia, Westw., = *lansbergii*, Sallé; *Euryomia 4-maculata*, Westw., = *stella*, Gory & P.; *Clinteria tricolorata*, Westw., = *suavis*, Burm.; *Anochilia marginicollis*, Westw., = *levigata*, G. & P.; *Euphoria belli*, Sharp, = *candezii*, O. E. Jans.; and errors in localities corrected: O. E. Janson, Cist. Ent. ii. pp. 146 & 147. *Gymnetis rufilateris*, Gory & Perch., *nec* Illig., renamed *goryi*, p. 247; a table of the species of *Gnathocera*, pp. 255 & 256; *G. elata*, F., is distinct from *trivittata*; *G. angolensis*, Westw., is wrongly referred by Gemminger and v. Harold to *Heterorrhina*: id. *tom. cit.*

Cocoon and pupa (? of *Diplognatha silacea*) from Camaroons; P. E. Soc. 1874, p. vi.

Ceratorrhina 4-maculata, F., ♂, from Camaroons, described; H. W. Bates, Tr. E. Soc. 1877, p. 201.

Gnorimus variabilis. On its transformations; A. Lajoye, Nouv. et faits, 1877, p. cxxix.

New genera and species :—

Tamisoria, J. Thomson, Bull. Soc. Ent. Fr. (5) vii. p. lxxxi. Near *Astenorrhina*, Westw., but with ♂ quite glabrous, and its head armed with two obtuse projections; mesosternal projection long and narrow. *T. deyrollei*, p. lxxxii., Sierra Leone.

Raceloma, id. l. c. p. cxiii. *Goliathides*: near *Tmesorrhina*, but shorter, with less elongate clypeus, stouter antennæ and mandibles, sub-semicircular thorax, different mesosternal projection, and simple anterior tibiæ. For *Heterorrhina induta*, Schaum, = *natalensis*, Hope.

Badizobla, id. l. c. p. cxv. *Ischnostomites*: near *Heterophana*, with different mesosternal projection, simple anterior tibiæ, &c. *B. cervinus*, p. cxvi., Guinea.

Digenethle, id. l. c. p. clxxvi. Allied to *Lomaptera* from its scutellum being half covered by the thorax, but resembling *Eupocila* in other characters. *D. ramulosipennis*, *ibid.*, Northern New Guinea.

Genyodonta leviplaga, A. Raffray, R. Z. (3) v. p. 329, pl. ii. fig. 1, Zanzibar.

- Cotinis adpersa*, p. 136, Nicaragua, *gracilis*, p. 137, Honduras, D. Sharp, J. L. S. xiii. p. 137.
- Stethodesma cincticollis*, Raffray, l. c. p. 330, pl. ii. fig. 2, Zanzibar.
- Clinteria cariosa*, Janson, l. c. p. 247, Lake Nyassa.
- Ischiopsopha dives*, Gestro, l. c. p. 87, Island Salwatty.
- Lomaptera yorkiana*, p. 248, Cape York, *nicobarica*, p. 249, Nicobar Islands, Janson, l. c.; *L. fuscipennis*, Kirsch, MT. Mus. Dresd. Heft ii. p. 142, New Guinea; *L. mohnikii*, p. lxxxviii., Java, *pulchripes*, p. lxxxix., Fitzroy Island, *subarouensis* [?], p. clxxxv., Aru, *amberbakiana*, p. clxxxvi., Amberbak, Northern New Guinea, Thomson, l. c.
- Gnathocera rufipes*, p. 250, *lurida*, p. 251, *gracilis*, p. 252, *villosa*, p. 254, Angola, *cruda*, p. 253, Lake Nyassa, Janson, l. c.
- Euphoria belti*, Sharp, l. c. p. 137, Nicaragua.
- Gametis zanzibarica*, Raffray, l. c. p. 331, pl. ii. fig. 3, Zanzibar.
- Glycyphana scutellata*, p. 142, Borneo, *andamensis*, p. 143, Andaman Islands, *nicobarica*, p. 144, Nicobar Islands, Janson, l. c.
- Elaphinis levis* and var., id. l. c. p. 256, Lake Nyassa.
- Anoplochilus indutus*, id. l. c. p. 257, Lake Nyassa.
- Tephrea rufo-ornata*, id. l. c. p. 259, Lake Nyassa.
- Oxythyrea lucens*, id. l. c. p. 258, Lake Nyassa; *O. (P) selika*, Zanzibar, and *flavo-maculata*, Pemba, p. 332, *O. rubriceps*, p. 334, Zanzibar, Raffray, l. c.
- Protatia andamanarum*, p. 145, Andaman Islands, *advena*, p. 260, Cape York (the only known Australian species), *conspersa*, p. 261, Borneo, Janson, l. c.
- Pachnoda simonsi*, id. l. c. p. 262, Lake Nyassa; *P. fairmairii*, Raffray, l. c. p. 331, pl. ii. fig. 4, Abyssinia.
- Diplognatha viridula*, p. 146, Cape Coast, W. Africa, *striata*, p. 263, Lake Nyassa, Janson, l. c.
- Cymophorus quadrimaculatus*, Raffray, l. c. p. 335, Abyssinia.
- Cœnochilus agyrsibanus*, id. *ibid.*, Zanzibar.
- Inca davisii*, C. O. Waterhouse, Cist. Ent. ii. p. 228, Peru.
- Ceratorrhina loricata*, Janson, l. c. p. 141, Angola; *C. hornimani*, Cameroons, and *grandyi*, Angola, Bates, Tr. E. Soc. 1877, p. 202.

BUPRESTIDÆ.

Chrysobothris affinis, p. 381 (and pupa), figs. 170-173, *Agilus angustulus*, p. 385, *Dicerca anea*, p. 390, *Melanophila decostigma*, p. 392, *Anthaxia corsica*, Rche., p. 393, *A. funerula* (in *Ulex europæus*), p. 395, *Acmaeodera lanuginosa*, p. 396, *Sphenoptera gemellata*, p. 398, *Coræbus bifasciatus*, p. 398, fig. 180, *C. undatus*, p. 402, *C. œneicollis*, p. 403 (and pupa), fig. 181, *Agilus aurichalceus*, Redt., and *hyperici*, Creutz., p. 406, *Aphanisticus emarginatus*, p. 407, figs. 182-188; larvæ described, with indication of those of allied species, table of genera by their larvæ, and many economic and other observations of value; É. Perris, Ann. Soc. L. Lyon (n.s.) xxii.

Sternocera castanea, Ol., commonly called "Bibi," flies at twilight in the Upper Nile region; P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 509,

note. Observations on its microscopic structure; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. xcvi.

Curis and *Neocuris*. The Australian species recorded; L. Fairmaire, Ann. Soc. Ent. Fr. (5) vii. pp. 327-333, 334-340.

New genus and species :—

Callistroma, Fairmaire, Pet. Nouv. ii. p. 153. Very near *Pliona*, Deyr., but with mesosternum and metasternum equal. *C. oxypyra*, ibid., Upolu.

Julodis corrosa, p. cliz., *iridescens*, p. clx., Jerusalem, *cælatocollis* [-ti-] and *puberula*, p. clx., S. Algeria, L. Reiche, Bull. Soc. Ent. Fr. (5) vii.

Psiloptera scintillans, C. O. Waterhouse, Tr. E. Soc. 1877, p. 6, Andaman Islands.

Buprestis (? *Ancylochira*) *enysi*, D. Sharp, Ent. M. M. xiii. p. 193, New Zealand. (Is a *Nascio*; C. O. Waterhouse, l. c. p. 7.)

Iridotenia cupreo-varia and *purpureipennis*, Waterhouse, l. c. p. 5, Andaman Islands.

Paracupta hypocala, *basicornis*, *pyroglypta*, and *anomala*, p. 153, Ena-Tonga, *pyrura*, p. 166, Fiji, Fairmaire, Pet. Nouv. ii.

Dicercomorpha cæruleipennis, p. 153, Vavao, *pyrochlora*, p. 166, Kandaon, id. l. c.

Chalcotenia australis, Rockhampton, *telamon*, Gayndah, id. l. c. p. 166.

Catoxantha rajah, R. Gestro, Ann. Mus. Genov. ix. p. 350, Borneo.

Cyphogastra gloriosa, Misor and Mafor, and *albertsi*, Yule Island, p. 352, *sulcipennis*, ibid., *æneo-foveata* and *impressipennis*, p. 353, *Jobi geelwinkiana*, p. 353, Mafor, and var. *flavitaris*, p. 354, Misor, id. l. c.

Polycesta arabica, id. l. c. p. 354, Aden.

Curis formosa, id. l. c. p. 431, Queensland.

Curis despecta, Champion Bay, *intercristata*, Swan River, p. 328, *chlo-riantha*, p. 330, King George's Sound, *viridi-cyanea*, p. 332, Rockhampton, and var. from Cape York, *brachelytra*, p. 333, Australia, Fairmaire, Ann. Soc. Ent. Fr. (5) vii.

Neocuris monochroma, p. 334, *cærulans*, *viridimicans*, and *dichroa*, p. 335, *anthaxioides* and *cuprilatera*, p. 336, *pauperata* and *sonor*, p. 337, *discoflava* and *asperipennis*, p. 339, *thoracica*, p. 340, id. l. c. various Australian localities.

Castalia obscura, Gestro, l. c. p. 354, Amboina and Buru.

Sphenoptera heydeni, Gredler, Verh. z.-b. Wien, xxvii. p. 510, Khartum; *S. andamanensis*, Waterhouse, l. c. p. 6, Andaman Isles.

Belionota deyrollei, Malacca and Borneo, *cribricollis* and *humeralis*, p. 355, Malacca, *fulgidicollis*, p. 356, N. and S. New Guinea, Gestro, l. c. ix.; *B. auricolor* (Deyr., MS.), id. op. cit. x. p. 652, Menado.

Chysobothris microstigma, N.W. New Guinea, and *keyensis*, Key Island, id. op. cit. ix. p. 356; *C. ritsemæ*, id. op. cit. x. p. 652, Borneo.

Cisseis cornuta and *albertsi*, p. 357, *cuprifera*, p. 358, id. op. cit. ix., Cape York.

Coræbus purpureicollis, id. l. c. p. 358, Celebes.

Sambus argentatus, id. ibid., N.W. New Guinea.

- Agrilus rooroensis*, p. 359, Yule Island, *papuanus*, *ibid.*, and *pini*, p. 360, N.W. New Guinea, *kandarcus*, p. 360, Celebes, *id. l. c.*
Aphanisticus marginicollis, *id. l. c.* p. 360, Celebes.
Endelus mephistopheles, *id. l. c.* p. 361, Ternate.
Trachys elegans, p. 361, Java, *australasiæ*, p. 362, Cape York, *id. l. c.*

THROSCIDÆ.

Trizagus modestus, sp. n., J. Weise, Verh. Ver. Brünn, xv. p. 23, Hermannstadt.

ELATERIDÆ.

SHARP, D. On the *Elateridæ* of New Zealand. Ann. N. H. (4) xix. pp. 396-413, 469-487.

The author enumerates 62 species (mostly new), which indicate a very isolated fauna, nearer that of Chili than any other country, and next to Australia. Among the new genera is one, *Protelater*, "a primitive form or synthetic type," partaking of the head-characters of the *Throscidæ* and *Eucnemidæ*. The latter family are not considered by the author to be separable from the *Elateridæ*; and the antennary cavities are deemed to be of as much importance here as in the *Buprestidæ*. *Elater zealandicus*, White, is distinct from *punctithorax*, Wh.

Megapenthes tibialis, p. 1 (also pupa), figs. 189-200, *M. lugens*, p. 5, figs. 201 & 202, *Adelocera fasciata*, p. 9, fig. 203, *Elater crocatus*, p. 10, *E. balteatus*, p. 11, *Cardiophorus rufipes*, p. 11, figs. 204-208, *Melanotus sulcicollis*, Muls., p. 16, *Corymbites latus*, p. 17, figs. 209-212, *Athous mandibularis*, Duf., p. 20, fig. 213, *Agriotes ustulatus*, p. 22, fig. 214, *Drasterius bimaculatus*, p. 24, figs. 215 & 216; larvæ described, with incidental observations on those of other species and a synoptical table of genera by their larvæ; É. Perris, Ann. Soc. L. Lyon (n.s.) xxii.

Alaus oculatus infested by *Chelifer alius*, sp. n.; L. Leidy, P. Ac. Philad. 1877, p. 260.

Melanotus hidalgoi, Per. Arc., = *picticornis*, Heyd.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Cardiophorus rufipes, Fourc., in Scotland; G. C. Champion, Ent. M. M. xiii. p. 227.

New genera and species:—

D. Sharp, *l. c.*, describes the following from New Zealand:—

Thoramus, p. 403. Allied to *Diacantha nigra*, Sol., but with more developed antennæ, more elongate clypeus, and more raised borders to the mesosternal cavity. *T. wakefieldi*, p. 399 (larva and pupa described), *obscurus*, p. 401, and *feredayi*, p. 402; also *Ochosternus parryi*, Cand., and *Elater punctithorax*, White, = *lævithorax*, White.

Amphiplatys, p. 406. Antennæ bilaterally symmetrical; allied to *Cryptohypnus*. *A. lawsoni* (Janson, MS.), *ibid.*

Panspæus, p. 409. Related to *Betarmon*; has a longitudinal furrow, as in many Eucnemids, close to and parallel with the margins of thorax beneath; clypeus concealed, &c. *P. guttatus*, *ibid.*

Aglophus, *ibid.* Near *Betarmon*, but differing in the prosternal process and mesosternal cavity. Facies of *Adrastus* or *Dolopius*. *A. modestus*, *ibid.*

Lomemus, p. 412. Allied to *Aglophus*, differing in the prosternal sutures, less diminished femoral portion of hind coxal plate, and less developed third and fourth joints of tarsi. *L. pilicornis* and *pictus*, p. 410, *suffusus*, *flavipes*, and *similis*, p. 411, *obscuripes*, *elegans*, and *collaris*, p. 412.

Mecastrus, p. 470. Allied to *Lomemus*, but larger, and connecting the *Betarmon* allies with Candèze's "Elatérites." *M. convexus*, *vicinus*, and *discedens*, p. 469.

Parinus, p. 479. Allied to *Hapatesus hirtus*, Cand., but with membranous lobes beneath third and fourth joints of tarsi. *P. villosus*, p. 478.

Geranus, p. 482. Structure of the head intermediate between that of the ordinary forms of *Elateridae* and the genus next named. *G. crassus*, p. 480, *fulvus* and *similis*, p. 481; also *Limonius collaris*, Pasc., and *Elatér lineicollis*, White, with which *Acrioniopus grandis*, Redt., is ? identical.

Protelater, p. 484. Offers an important obstacle to the separation of the *Throscidae* and *Eucnemidae* from the *Elateridae*. Of peculiar narrow form, with elongate cylindrical thorax. *P. elongatus* and *huttoni*, p. 482, *guttatus*, *picticornis*, and *opacus*, p. 483 (and sp. from Chili).

Neocharis, p. 486. *Eucnemidae*, near *Xylobius* and *Hylocharis*. *N. varia*, *pubescens*, *simplex*, and *concolor*, p. 485.

Taleræ, p. 486. Allied to the preceding, but with variable labrum. *T. distans*, *ibid.*

Metablax brouni, p. 403 (*Elater acutipennis*, *approximans*, and *cinetiger*, White, apparently also belong to *Metablax*, which is recharacterized, p. 405, and associated with *Semiotus*).

Betarmon gracilipes, *frontalis*, and *lætus*, p. 407, *obscurus*, p. 408.

Monocrepidius exsul, p. 470.

Cryptohypnus powelli, *humilis*, *frontalis*, and *longicornis*, p. 471, *thoracicus*, p. 472.

Chrosis polita, p. 472, *reversa*, p. 473, *elongata*, p. 474 (*Chrosis* ? = *Corymbites*).

Corymbites dubius, p. 476, *agrioides*, p. 477.

Alaus nodulosus, C. O. Waterhouse, Tr. E. Soc. 1877, p. 4, Andaman Islands.

Anoplischius landolti, E. Steinheil, MT. Münch. ent. Ver. i. p. 79, Ocaña, Colombia.

Ischiodontus piceipennis and *vittatus*, *id. l. c.* p. 80, Ocaña.

Monocrepidius ocananus, *id. ibid.*, Ocaña.

Athous raddii, p. 307, Caucasus, *astrabadensis*, p. 309, Astrabad, J. Faust, Hor. Ent. Ross. xii.

Elater lepidus, F. W. Mäklin, Öfv. Fin. Soc. xix. p. 30, Siberia.

Æolus basalis, p. 81, *bisignatus* and *multisignatus*, p. 82, *fissus*, p. 83, Steinheil, *l. c.*, Ocaña.

Anchastus apicalis, id. l. c. p. 83, Ocaña; *A. compositarum*, T. V. Wollaston, Col. St. Hel. p. 69, St. Helena.

Orthostethus landolli, Steinheil, l. c. p. 84, Ocaña.

RHIPIDOCERIDÆ.

Callirrhapis. The males are always more or less pubescent above. *C. championi*, Westw., ♀ = *templetoni*, Westw., ♀; *C. orientalis*, Cast., ♀ = *javanica*, Cast., ♀. C. O. Waterhouse, Tr. E. Soc. 1877, pp. 379 & 38 (*C. laportii*, Hope, var., p. 393).

Callirrhapis dissimilis, p. 380, ♂, p. 381, ♀, Borneo; *C. fasciata*, p. 381, Ceylon, *trepida*, p. 382, Batchian, *stabilis*, Ceram, and *bowringi*, Penang, p. 383, *antiqua*, p. 384, Philippine Isles, *robusta*, Siam, and *longicornis*, Andaman Isles, p. 385, *femorata*, Samoa, and *leta*, Sylhet, p. 386, *lineata*, p. 387, Borneo (males only); *C. costata*, Fiji Isles, and *gausapata*, Burma, p. 388, *residua*, Java, and *suturalis*, Penang, p. 389, *cribrata*, p. 390, Borneo, *cyaneicollis* and *reticulata*, p. 391, India (females only); *C. in conspicua*, Brazil, and *simplex*, Rio, p. 392, Waterhouse, l. c., *C. cylindroides*, Tonga, and *devasa*, Pelew Isles, L. Fairmaire, Pet. Nouv. ii. p. 153: spp. nn.

DASCILLIDÆ.

Epichorius, g. n., T. Kirsch, Deutsche E. Z. 1877, p. 165. *Artematopides*: near *Artematopus*, but with very minute fourth tarsal joint. *E. aucklandie*, sp. n., p. 166, Auckland Isles (which is represented by the figure and part of the description of *Pseudohelops tuberculatus*, Guérin and Blanchard, in the 'Voyage au Polo sud').

Helodes atkinsoni and *maculatus*, C. O. Waterhouse, Ent. M. M. xiv. p. 27, Tasmania; *H. subterraneus*, E. Mulsant & C. Rey, Ann. Soc. Linu. Lyon (n.s.) xxii. [for 1875, published in 1876], p. 189, Massane, E. Pyrenees [Zool. Rec. xii. p. 329]: spp. nn.

TELEPHORIDÆ.

Lycides.

C. O. WATERHOUSE, Tr. E. Soc. 1877, pp. 73-86, monographs the Australian species, including 24 new, raising the number to 38. *Metriorrhynchus*, Guérin, merges generically in *Porrostoma*, Casteln. Various portions of external anatomy are figured, pls. i. & ii.

Calochromus monographed; C. O. Waterhouse, Cist. Ent. ii. (June 30, 1877) pp. 195-202, pl. ii. (containing various portions of external anatomical detail). Sexual discrimination is indispensable.

Eros rubens, p. 28, figs. 217-219; larva described, it has quite positively no metathoracic stigmata. É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii.

New genera and species :—

Trichalus, Waterhouse, Tr. E. Soc. 1877, p. 82. Separated from *Porrostoma* on account of a deep lanceolate impression on the disk of the thorax, &c. For *Lycus serraticornis*, F., pl. ii. figs. 109-112, *Porrostoma*

discoideum, Er., figs. 106 & 108, and *T. flavo-pictus*, p. 82 figs. 92-96, *ampliatus*, figs. 97-101, and *sulcatus*, figs. 102-105, p. 83, Australia.

Xantheros, L. Fairmaire, Pet. Nouv. ii. p. 167. Near *Eros*, but with flattened antennæ with scarcely distinct second joint, scutellum bilobed at apex, and flattened legs and coxæ. *X. ochreateus*, *nubicollis*, and *angulicollis*, *ibid.*, Sydney and Queensland.

Melaneros, *id. l. c.* p. 173. Also very near *Eros*, but with more slender antennæ, of which the third joint is not less than the following, non-areolated thorax, &c. *M. acuticollis*, *ibid.*, Upolu, *atro-violaceus*, *prelongus*, *lugubris*, and *angustiformis*, Fiji Islands, *quadraticollis*, Tongatabu, p. 174.

Lycus leveillæi, p. 363, Gaboon, Old Calabar, *raffrayi*, p. 364, Abyssinia, *adumbratus*, p. 365, Colombia, J. Bourgeois, Ann. Soc. Ent. Fr. (5) vii.

Dictyoptera eximia, *id. l. c.* p. 365, Colombia, Venezuela.

Calopteron dilatatum, *id. l. c.* p. 366, Colombia.

Porrostoma brevisrostre, pl. i. figs. 13 & 14, and *laterale* (Redt.), figs. 15-17, p. 74, *abdominale*, figs. 19-22, and *elegans*, figs. 23-27, p. 75, *uniforme*, figs. 28-31, and *irregulare*, figs. 18 & 18 a, p. 76, *textile*, figs. 32-35, *russatum*, figs. 36-38, and *apicale*, figs. 39-44, p. 77, *lineatum*, figs. 45-48, and *togatum*, figs. 49-52, p. 78, *scalare*, figs. 53-56, and *fullax*, figs. 57-60, *salebrosum*, pl. ii. figs. 61-64, and *hemorrhoidale*, figs. 61 a-64 a, p. 79, *plagiatum*, figs. 65-68, *lugubre*, figs. 69-72, and *cinctum*, figs. 73-77, p. 80, *clientulum*, figs. 78-81, *inquinulum*, figs. 82-86, and *limbatum*, figs. 88-91, p. 81, *dichroum*, p. 86, figs. 86 & 87, Waterhouse, *l. c.*, various Australasian localities.

Cladophorus nigriceps, T. Kirsch, MT. Mus. Dresd. Heft ii. p. 143, New Guinea.

Calochromus basalis, fig. 2, Swan River, *melanurus*, fig. 3, Penang, Java, Sumatra, p. 196, *orbatus*, p. 197, fig. 4, Philippine Islands and Darjeeling, *æmulus*, p. 198, fig. 6, Sarawak, *rugatus*, fig. 7, and *ruber*, fig. 8, Allahabad, *velutinus*, fig. 9, Burma, p. 199, *vestitus*, p. 200, fig. 10, Penang, *lepidus*, fig. 11, Java, Penang, *longipennis*, fig. 12, Sumatra, p. 201, *dispar*, p. 202, fig. 13, Borneo, Waterhouse, Cist. Ent. ii.; *C. discicollis* and *insidiator*, Fairmaire, *l. c.* p. 174, Australia.

Lampyrides.

Luciola picticollis, Kies., and *♀ vitticollis*, Kies., = *cruciata*, Mots.; *Lucidota vulnerata*, Kies., = *biplagiata*, Mots.: E. v. Harold, Deutsche E. Z. 1877, p. 357.

Alecton indicus, sp. n., A. Chevrolat, MT. Münch. ent. Ver. i. p. 11, E. Indies.

Telephorides.

Cantharis luteipennis, Kies., = *Telephorus suturellus*, Mots.; Harold, *l. c.* p. 357.

Rhagonycha melanura, ♂, and *Ctenonychus filiformis*, ♀, in copulâ; D. Buddeberg, Ent. Nachr. iii. p. 147.

Selenurus, g. n., L. Fairmaire, Pet. Nouv. ii. p. 167. Near *Ichthyurus*,

but palpi not securiform, with longer elytra, and abdomen not furcate. *S. luteo-pictus*, sp. n., *ibid.*, Peak Downs, Australia.

Polemion basalis, sp. n., C. O. Waterhouse, Ent. M. M. xiv. p. 28, Borneo.

Podabrus majori, sp. n., F. Piccioli, Bull. Ent. Ital. ix. p. 230, pl. viii. fig. 1, Serrabassa, Apennines.

Malthinides.

S. A. de Marseul, L'Ab. xvi. (sep. paging), commences (Nos. 199 & 200) a monograph of the species of the Old World.

Malthinus trigibber, p. 16, Palestine, *scapularis*, p. 23, Malta, *sulcicollis*, p. 24, *nigribuccis*, p. 34, *inflavus*, p. 36, Algeria, spp. nn., *id. l. c.*

Malachiides.

PEYRON, E. Étude sur les Malachiides d'Europe et du bassin de la Méditerranée. Paris: 1877, 12mo, pp. 312.

This treatise was issued with and forms a part of vol. xv. (= 3rd series, vol. iii.) of "L'Abeille." The subject is treated in an able manner; each species being described at some length, with bibliography, synonymy, and tables for the discrimination of such genera as contain numerous species. An appendix refers to doubtful or unknown species, and in it De Marseul reproduces the descriptions of Wollaston's Madeiran and Canarian species, and also of some of Motschoulsky's. A catalogue and alphabetical index complete the work. Among the synonymical and other observations, the following occur:—

Malachius nitidicollis, Chev., = *Cyrtosus corniculatus*, Ktz., ♀; *Oogines*, Muls., is not entitled to generic rank, and *O. signicollis*, Muls., = *Mal. bicolor*, Perr., = *C. longicollis*, Er., var.; *M. armeniacus*, Mén., = *geniculatus*, Germ., var.; *Antholinus*, *Pelochrus*, *Nepachys*, and *Sphinginus*, Muls., are sunk in *Attalus*; *Attalus luxurians*, Er., = *erythroderus*, Er.; *Anthocomus transfuga*, Kies., = *Att. nourrecheli*, Cast.; *Colotes anthicinus*, Baudi, = *Antidipnis flavo-cinctus*, Mars., var.; *C. hampii*, Redt., = *maculatus*, Cast., var.

Malachius foveifrons, Kies., = *prolongatus*, Mots.; E. v. Harold, Deutsche E. Z. 1877, p. 357.

Axinotarsus pulicarius. Larva and pupa described, with observations on allied species and the importance of the larva in establishing genera; É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. p. 32, figs. 220-227.

New genera and species:—

Peyron, *l. c.* describes the following:—

Psiloderes, p. 223. Facies of *Anthicus* or *Ptinus* [!]; nearer *Charopus* than *Troglops*; head of ♂ cornuted, apex of elytra simple. For *Charopus formicarius*, Reche. & Saulcy.

Embrocerus, p. 225. Analogy with *Charopus*, but with the head of ♂ much enlarged between the eyes and deeply excavated in the middle, and last joint of maxillary palpi sharp at apex. Apparently allied to *Cephaloncus* and *Condyllops*. For *E. variegatus*, p. 227, Balbek.

Trogliciscus, p. 232. Facies of *Troglops*, but with anterior tarsi 5-jointed in both sexes; maxillary palpi with last joint oval, strongly truncate. For *Troglops rhinoceros*, Mars.

Heterodipnis, p. 261. Differs from *Antidipnis* and *Colotes* in the conical apical joint of the maxillary palpi in the ♀ as well as generally in the labial and maxillary palpi in both sexes, in the less elongate first antennal joint, and the very slight lateral elytral plica. For *A. palpator*, Mars. (P *Colotes cinctus*, Mots.)

Cyrtosus (Mots., adopted as anterior to *Anthodytes*, Kies.) *æstivus*, p. 18, *frigidus*, p. 24, Lebanon, *cerealis*, p. 19, Beirut, *cælatus*, p. 23, Asia Minor.

Malachius bellieri, p. 53, Sicily, Malta; *fucatus*, p. 58 (= *Clanoptilus angustatus*, Mots., nec Mén.), *clavicornis*, p. 60, *junceus*, p. 62, *montanus*, p. 66, *heliophilus*, p. 84 (= *securicollatus*, Baudi, ♀), *palestinus*, p. 93, *capricornis*, p. 94, *paludosus*, p. 110, Syria; *ambiguus* (= *geniculatus*, var., Er.) with var. *æneo-cupreus*, p. 102, S. Europe and Asia Minor, *cedricola*, p. 285, Lebanon.

Anthocomus oxyacanthæ, p. 286, Lebanon,

Axinotarsus ecaudatus, p. 135, Algeria.

Attalus marmottani, p. 145, Algeria, *fuscus*, p. 157 (belongs to the *Telephorides*, near *Malthodes*; p. 287) and *amænus*, p. 170, Syria, *melitensis*, p. 159, Italy and Malta.

Ebeus eximius, p. 175, and *velatus*, p. 192, Syria, *caspicus* (Becker, MS.), p. 177, Sarepta, *erythropus* (Mann., MS.), p. 183, E. Siberia, *baudueri*, p. 184, Smyrna, *rubetorum*, p. 187, Mersina, *limbellus* (Mann., MS.), p. 189, Dauria.

Hypebeus libanus [-*banicus*], p. 199, Lebanon, *vicinus*, p. 205, Smyrna and Ramleh.

Charopus nigricans, p. 220, Jaffa, *bicolor*, p. 221, Beirut and Palestine.

Troglops latifrons, p. 238, Algeria, *eburifer*, p. 244, Lebanon.

Hapalochrus unicolor (Mann., MS.), p. 272, Dauria, *maculicollis*, p. 274, S. Russia.

Laius guttulatus, *rugulipennis*, *plagiaticollis*, *quinque-notatus*, *quinque-plagiatus*, *verticalis*, *insignicornis*, *rufo-virens*, *fastidiosus*, *asperipennis*, and *oblongo-signatus*, L. Fairmaire, Pet. Nouv. ii. p. 174, various Australian localities.

Attalus australis, id. *ibid.*, Sydney.

Troglops basicollis and *corallifer*, id. *l. c.* p. 141, Algeria.

Carpurus facialis, *æneipennis*, *telephoroides*, *diopthalmus*, *cratistifrons*, *lesifrons*, *philonthoides*, *tachyporoides*, *segmentarius*, and *xanthochrous*, id. *l. c.* p. 161, various Australian localities; *C. venustus*, Kiesenwetter, Deutsche E. Z. 1877, p. 167, Auckland Isles.

Melyrides.

Dasys plumbeus, p. 36 (and pupa), figs. 228-233, *Psilothrix nobilis*, p. 39, fig. 234; larvæ described. Perris, *l. c.*

Dasytes wakefieldi, sp. n., D. Sharp, Ent. M. M. xiv. p. 8, Christchurch, New Zealand.

Melyris sieboldi, sp. n., P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 512 Gondokoro.

CLERIDÆ.

H. S. GORHAM, Tr. E. Soc. 1877, pp. 245-263, publishes a sequel to his paper in Cist. Ent. 1876. *Anisophyllus*, Westw., is referred to the *Til- lides*, Choresine, Pasc., dubiously to the *Melyrides* in the *Telephoridæ*; and many synonymical suggestions, &c., are made.

Phymatophæa, Pascoe, must be referred to the *Enopliides*, and is not near *Scrobiger*; its characters are supplemented, and *Eleale opiloides*, Pasc., is considered congeneric with *P. electa*, Pasc.; D. Sharp, Ent. M. M. xiv. p. 8. *P. electa*, Pasc. = *Pelonium pustuliferum*, Westw.; H. S. Gorham, Tr. E. Soc. 1877, p. 418.

Tillus elongatus, p. 41 (and pupa), figs. 235-240, *Opilus pallidus*, p. 44, fig. 241, *Corynetes ruficornis* (destructive to *Anobium paniceum*), p. 44, fig. 242, *C. ruficollis*, p. 48, figs. 243 & 244 (larval differences support the division of *Corynetes* into *Corynetops* and *Agonolia*); larvæ described. E. Perris, Ann. Soc. L. Lyon (n.s.) xxiii.

New genera and species:—

Paupris, Sharp, Ent. M. M. xiii. p. 271. Provisionally near *Opilus*; elytra less developed than usual. *P. aptera*, ibid., Auckland, New Zealand.

Parmius, id. l. c. p. 272. Differs from *Paupris* in its finely granulated eyes, possession of wings, and more normal elytra. *P. longipes* and *debilis*, ibid., New Zealand.

Balcus, id. op. cit. xiv. p. 7. Near *Thanasimus*, but with apical joint of maxillary palpi large and basal joint of tarsi more atrophied. *B. niger*, ibid., New Zealand.

Mathesis, C. O. Waterhouse, Tr. E. Soc. 1877, p. 7. Most nearly allied to *Eburifera*, but with a long antennal club, and the less broad third joint of tarsi not bilobed. *M. guttigera*, sp. n., id. l. c. p. 8, New Zealand (resembles the Cerambycoides *Zorion guttigerum*, with which it is associated and upon which it is probably parasitic).

Isolemidia, Gorham, l. c. p. 257. Very close to *Lemidia*, differing in coloration, larger eyes, more atrophied basal joint of tarsi, &c. *I. pulchella*, p. 258, *batesi* and *apicalis*, p. 259, River Amazon, and *I. (?) subtilis*, p. 259, Rio Janeiro.

Omadius mucronatus, T. Kirsch, MT. Mus. Dresd., Heft ii. p. 144, Mysol.

Epiphleus chevrolati and *pulcherrimus*, p. 246, *velutinus* and *ter-zonatus*, p. 247, *capitatus* and *nitidus*, p. 248, Gorham, l. c., Amazon River.

Lemidia rufa and *oblique-fasciata*, p. 251, *dia*, *interrupta*, and *maculicollis*, p. 252, *elongata*, p. 253, *subenea* and *filiformis*, p. 254, *suturalis*, *pilosa*, and *concinna*, p. 255, *bifurcata* and *labiata*, p. 256, *plumbæa*, p. 257, id. l. c., Australasia.

Hydnocera marginata, p. 260, and *guatemalæ*, p. 261, Guatemala, *flavifemorata* and *pallipes*, p. 261, and *rufithorax*, p. 262, River Amazon, *virescens*, Rio Janeiro and Parana, and *olivacea*, Parana, p. 262, *id. l. c.*

Tenerus parriani, Indian Archipelago, and *siamensis*, Siam, p. 402, *cruentatus*, Laos, and *ceramensis*, Ceram, p. 403, *javanus*, Java, *flavicollis* and *cyaneus*, Laos, p. 404, *chalybeus*, Singapore, *doreyanus*, New Guinea, and *andamanensis*, Andaman Isles, p. 405, *fuscipennis* and *discolor*, p. 406, Ceram, Cambodia, &c., *mindanaonicus*, Mindanao, and *difficilis*, New Guinea, p. 407, *incertus*, Aru, *persimilis*, Dorey, and *apicalis*, Ceylon, p. 408, *melanurus*, p. 409, Ceylon, *id. l. c.*; *T. hilleri*, Harold, Deutsche E. Z. 1877, p. 357, Hagi, Japan.

Phymatophæa hilaris, p. 7, *longula*, p. 8, Sharp, *op. cit.* xiv., New Zealand (the former = *Mathesis guttigera*, C. O. Waterh.; *id. l. c.* p. 39).

Ichne (tabulated, p. 409) *funesta* and *subfasciata* (? sexes), p. 410, *mitella* and *disjuncta*, p. 411, *mimica* and *batesiana* (var. ? *peloniodes*, p. 413), p. 412, *plumbea* and *incerta*, p. 413, *fumigata* and *obscura*, p. 414, *vitticollis* and *nitida*, p. 415, Amazon district, *impressocollis* [-*sicollis*], p. 414, and *fryana*, p. 415, Rio Janeiro, &c., Gorham, *l. c.*

Pyticera flavicollis and *coronata*, *id. l. c.* p. 416, Amazon district.

Pelonium optabile, Minas Geraes, and *ruficollis*, Rio, p. 419, *semirufum*, *badeni*, and *difforme*, p. 420, *bipunctatum* and *micans*, p. 421, *irroratum* and *ridens*, p. 422, *pictipenne* and *confluens*, p. 423, and *maculosum*, p. 424, various Brazilian localities, and *P.* (? g. n.) *extraneum*, p. 424, Laos, *id. l. c.*

CUPESIDÆ.

Cupes ocularis, Pasc., = *clathratus*, Solsky; E. v. Harold, Deutsche E. Z. 1877, p. 358.

PTINIDÆ.

H. v. KIESENWETTER, *Ins. Deutschl. i. v. pt. 1*, in the family "*Anobiadæ*," includes *Bostrichini*, *Anobiini*, and *Ptinini*, describing the German species. Leaving the first for notice under *Bostrychidæ*, the *Ptinini* are divided into "*Gibiini*" and "*Ptinini veri*," and the *Anobiini* into *Anobiini i. sp.* (*A. genuini* and *Xyletinini*) and *Dorcatomini*. Stress is laid upon the structure of the wings, which are in some cases figured. *Mezium affine*, Boield., = *sulcatum*, F., var.; *Ptinus alpinus*, Boield., = *irroratus*, Kies., var.; *P. bidens*, Muls., = *quercus*, Kies.; *P. pulchellus*, Bld., = *obesus*, Lnc.; *P. intermedius*, Bld., and *P. subpilosus*, Stm., = *pilosus*, Müll.; *Amnihilobolus*, Muls., = *Episernus*, Thoms., which stands; *Artobium*, Muls., = *Sitodrepa*, Thoms.; *Liozoum*, Muls., = *Conopheribium*, Chevr., = *Ernobius*, Thoms.; *Trypopitys raymondi*, Muls., = *cylindricus*, Germ.; *Amblytoma*, Muls., = *Anitys*, Thoms.; more synonymy indicated.

Anobium denticolle, p. 68, figs. 254-256, *A. fulvicorne*, p. 70, *Oligomerus brunneus*, p. 71, *Gastrallus levigatus*, p. 73, figs. 257-259, *Ptilinus pectinicornis*, p. 76 (and pupa), figs. 260-263, *Xyletinus oblongulus*, Muls., p. 79, fig. 264, *Pseudochina*, p. 80, figs. 265-267, *Stagetus pellitus*, Chevr., and *Dorcatoma*, p. 81, *Aspidophorus lareynici*, Duv., p. 82 (and pupa),

figs. 268-275, *Ptinus ornatus* and *germanus*, p. 90; larvæ described, with table of genera by their larvæ, and observations on those known already; É. Perris, Ann. Soc. L. Lyon (n.s.) xxiii.

Hedobia pubescens, from the Caucasus, with unpunctured head and thorax; J. Faust, Bull. Mosc. lii. pt. 2, p. 37.

Ptinus minimus, Heyd., = *Niptus constrictus*, Kies.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

Eutheca, g. n., Kiesenwetter, l. c. p. 155, note. Allied to *Stagetus*; two apical joints of antennæ almost fused together. *E. solida*, sp. n., *ibid.*, Portugal.

Hedobia capucina, sp. n., E. Reitter, Deutsche E. Z. 1877, p. 376, Japan.

Ptinus japonicus, id. l. c. p. 377, Japan; *P. crassicornis*, p. 50, Italy, corsicus, p. 55, Corsica, *atricapillus*, p. 56, Naples, *calcaratus*, p. 75, Görz, Kiesenwetter, l. c.: spp. nn.

Niptus helleri, sp. n., Reitter, l. c. p. 378, Japan.

Episernus hispanus, sp. n., Kiesenwetter, l. c. p. 100, Andalusia.

Ernobius tabidus, sp. n., id. l. c. p. 126 (Germany).

Nicobium fasciculare, sp. n., Reitter, l. c. p. 378, Japan.

Ptilinus marmoratus, id. l. c. p. 379, Japan; *P. fissicollis*, id. Verh. Ver. Brünn, xv. p. 24, Hungary; *P. punctato-striatus*, J. Faust, Bull. Mosc. lii. pt. 2, p. 35, Sumatra: spp. nn.

Xyletinus maculatus, Derbend, and *sareptanus* (? = *tenebricosus*, Solsky), *Sarepta*, spp. nn., Kiesenwetter, l. c. p. 146, note.

Lasioderma pulverulenta [-tum], sp. n., Reitter, l. c. p. 379, Japan.

Mesocapopus longiusculus, sp. n., id. l. c. p. 380, Japan.

BOSTRYCHIDÆ.

H. v. KIESENWETTER, Ins. Deutschl. (1) v. pt. 1, describes the German species under a division *Bostrichini* of his "*Anobiadæ*" (pp. 6-41). This division is composed of *Psoini*, *Sphindini*, *Lyctini*, *Bostrichini veri*, and *Hendecatomini*. *Aspidophorus* is dissociated from *Sphindus*, and considered to belong to the *Silphidæ* (p. 18; at p. 198, it is considered most allied to the *Dermestidæ*, and is discussed as a separate family, *Aspidiphoridæ*, in this part of Ins. Deutschl., as the *Dermestidæ* were long ago published by Erichson in the same work. Thomson's suggested name *Conipora* is rejected, as *Aspidiphorus* is considered not to clash with the prior *Aspidophora* in Fishes and Crustacea, being derived from *ασπίδιον* [in which case it must be written *Aspidiophorus*] and not from *ασπις*; *Lyctus* (*Dermestoides*) *unipunctatus*, Hbst., is adopted for *canaliculatus*, F.; *Dinoderus elongatus*, Strübing, is referred to *Xylopertha*, and named *puncticollis* (p. 39). Stress is laid upon the shape and folding of the wings, which are in some cases figured.

Observations on larvæ of *Apate*, *Synoxylon*, and *Xylopertha*, with corrections of former descriptions; É. Perris, Ann. Soc. L. Lyon (n.s.) xxiii. p. 57, figs. 245 & 246.

Apate francisca requires a new generic name, as *Apate* was founded on

muricata (so that *Sinoxylon* falls), and *Ligniperda*, Pall., = *Bostrychus* (*capucinus*) and *Tomicus*; E. v. Harold, MT. Münch. ent. Ver. i. p. 120.

Xylopertha aterrima, Fald., is an *Apate*, and = *pustulata*, F.; J. Faust, Bull. Mosc. lii. pt. 2, p. 34.

LYCTIDÆ.

Lyctus canaliculatus. Larva and pupa described, and the affinity to the *Bostrychidæ* confirmed; É. Perris, l. c. p. 60, figs. 247-250 (see *Bostrychidæ*, *suprà*).

CICIDÆ.

Cis coluber, Perrin; larva described, É. Perrin, Ann. Soc. L. Lyon (n.s.) xxiii. p. 63, figs. 251-253.

Cis reflexicollis, Ab., = *punctulatus*, Luc., = *lucasi*, Ab.; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xix.

Cis hieroglyphicus, p. 380; *ornatus* and *bifusciatus*, p. 381, spp. nn., E. Reitter, Deutsche E. Z. 1877, Japan.

Rhopalodontus populi, sp. n., O. & H. Brisout de Barneville, Bull. Soc. Ent. Fr. (5) vii. p. cvii., St. Germain-en-Laye.

TENEBRIONIDÆ.

F. BAUDI DI SELVE, Bull. Ent. Ital. ix. pp. 25-54, 93-142, continues his enumeration and revision of species existing in Italian collections (*Helopides*, *Strongyliides*, and appendix to *Pedinides*). Some new species and varieties are described.

Zophosides.

Zophosis pfeiferi, sp. n., P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 513, Khartum.

Erodiides.

Piestognathus asperipennis, Fairm., = *douei*, Luc.; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xix.

Arthrodeis arabicus, sp. n., O. v. Kirschsberg, Deutsche E. Z. 1877, p. 204, Djedda.

Erodius thiebaulti, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 141, Algeria.

Annodeis wagneri, Algeria, *nitidus*, Egypt, spp. nn., A. Chevrolat, Pet. Nouv. ii. p. 113.

Adesmiides.

Adesmia maroccana, p. 283, Morocco, *brunnipes*, p. 284, Walfisch Bay, Haag-Rutenberg, Deutsche E. Z. 1877; *A. cursor*, Algeria, *mesopotamica*, Mesopotamia, *subserrata*, Egypt, *semi-glabra*, Syria, Beirut, Chevrolat, l. c. p. 113: spp. nn.

Tentyriides.

Tentyria interrupta. Larva described; É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. p. 94.

Calyptopsis morawitzi, sp. n., J. Faust, Bull. Mosc. lii. pt. 2, p. 37, Lake Goktschai.

Rhytidonota baudii, sp. n., P. V. Gredler, Verh. z.-b. Wien, xxvii. p. 514, Khartum.

Mesostena gracilis, id. l. c., Khartum and Gondokoro; *M. politipennis*, Fairmaire, Pet. Nouv. ii. p. 141, Algeria: spp. nn.

Oxycara athiopum, sp. n., Gredler, l. c. p. 515, Khartum.

Epitragides.

Himatismus revised by Haag-Rutenberg, Deutsche E. Z. 1877, pp. 273-283. Twenty-eight species are acknowledged (8 new). *H. latcollis*, Haag, = *mandibularis*, Er., ♀; *H. tessellatus*, Baudi, nec *tessulatus*, Gerst., renamed *baudii*, p. 283.

Himatismus ocularis, p. 276, Africa (? Bogos), *inconspectus*, p. 277, Bogos, *indicus*, p. 278, Hindostan, Cochin China, *antelope*, p. 279, *emarginatus*, p. 282, Hope Town, *striato-punctatus*, p. 280, Cape Colony, *muelleri*, p. 281, Zanzibar, *heydeni*, p. 282, Sennaar, id. l. c., spp. nn.

Adelostomatides.

Adelostoma parallelum and *ovalipenne*, Asia Minor, p. 117, *scabrum*, p. 118, Dalmatia, spp. nn., A. Chevrolat, Pet. Nouv. ii.

Stenosides.

Stenosia impunctipennis, sp. n., id. *ibid.*, Algeria, Tripoli.

Scaurides.

Diastolinus fuscicornis, sp. n., id. Bull. Soc. Ent. Fr. (5) vii. p. viii., Porto Rico.

Blaptides.

Prosodes persica, Faust, = *lavigata*, Baudi; *P. pustulata*, Ft., = *cribrella*, Bdi.; *Blaps scabiosa*, Ft., = *scabiosa*, Bdi.; J. Faust, Hor. Ent. Ross. xii. p. 331.

Blaps. On the value of the prosternum as a differential character; C. E. Leprieur, Bull. Soc. Ent. Fr. (5) vii. p. cvii.

Asidides.

Asida corsica, Cast., p. 96, *jurinii*, Sol., p. 97: larvæ described; Perris, l. c.

Cardiogenius subcostatus, Burm., = *cicatricosus*, Fairm., nec Sol., and stands; *C. cicatricosus*, Burm., was so written instead of *variolosus*, as intended, and = *granulatus*, Fairm.; *C. hirsutus*, Burm., = *crinifer*, Fairm.: H. Burmeister, S. E. Z. xxxviii. p. 68.

Nycteliides.

Nyctelia. Corrections in former statements as to *N. fitzroyi* and *dar-*

wini, based on insufficient material; H. Burmeister, S. E. Z. xxxviii. p. 69. *Epipedonota abnormis*, Burm., = *N. sulcicollis*, Waterh.

Nyctelia porcata and *laticauda*, spp. nn., *id. l. c.* p. 70, Eastern base of the Patagonian Cordilleras, near Lake Nahuel Huapi.

Pimeliides.

Ocnere perlata, Baudi, = *robusta*, Faust; *O. longicollis*, Baudi, = *crisosthi*, Faust: J. Faust, Hor. Ent. Ross. xii. p. 331.

Pimelia sardea. Larva described; Perris, *l. c.* p. 98.

Molyrides.

Molyris gredleri, sp. n., G. Haag-Rutenberg, Verh. z.-b. Wien, xxvii. p. 515, Gondokoro.

Vieta millengeni, sp. n., O. v. Kirschberg, Deutsche E. Z. 1877, p. 203, Djedda.

Physogastrides.

Edrotopus, g. n., Haag-Rutenberg, S. E. Z. xxxviii. p. 129. With a superficial resemblance to *Edrotes*: thorax broad, strongly contracted in front, with acute anterior angles, thickly strigillate. *E. strigicollis*, sp. n., *id. l. c.* p. 130, Cordova.

Praocides.

Platesthes burmeisteri, sp. n., Rutenberg, *l. c.* p. 156, Rio Sta. Cruz, Patagonia.

Oniontides.

Crypticus quisquilius. Larva described; Perris, *l. c.* p. 99.

Pedinides.

Holocrates gibbus, p. 101, *Heliopathes ibericus*, Muls., p. 103, larvæ described; Perris, *l. c.*

Dendarus (Pandarinus) armeniacus, sp. n., F. Baudi, Bull. Ent. Ital. ix. p. 140, no locality mentioned.

Opatrises.

Melanimon, Mots., recharacterized; J. Faust, Bull. Mosc. lii. pt. ii. p. 39.

Sinorus colliardi, Fairm., p. 103, *Microzoum tibiale*, p. 104, larvæ described; Perris, *l. c.*

Hadrodes, g. n., T. V. Wollaston, Col. St. Hel. p. 226. Allied to the Madeiran *Hadrus*, but coarsely sulcate, with entire labrum, thin scutellum, &c. *H. helenensis*, sp. n., p. 227, St. Helena.

Tarphiophasis, g. n., *id. l. c.* p. 227. Facies of *Tarphius*, coarsely tuberculated; allied to *Hadrodes*, but with head tuberculated, abdomen with first and second joints completely soldered, &c. *T. tuberculatus*, sp. n., p. 228, St. Helena.

Trachyscelides.

Phaleria cadaverina, p. 109, fig. 277, *P. hemisphærica*, Küst., p. 112, fig. 278, larvæ described; Perris, l. c.

Bolitophagides.

Bolitophagus reticulatus, p. 113, figs. 279–287, *armatus*, p. 116, figs. 288 & 289, larvæ and pupæ described; id. l. c.

Diaperides.

Platydemia violaceum, p. 118, figs. 290–296, *Hoplocephala hæmorrhoidalis*, p. 120, figs. 297–299, *Pentaphyllus testaceus*, p. 121 (and pupa), figs. 300–303, larvæ described; id. l. c.

Ischnodactylus, g. n., A. Chevrolat, Pet. Nouv. ii. p. 173. No differential characters or affinity suggested. *I. quadri-dentatus*, sp. n., *ibid.*, Java (altered to *quadri-oculatus*, p. 178).

Diaperis ceylonica, Ceylon, *suturalis*, Mexico, spp. nn., id. l. c. p. 170.

Hoplocephala jantnipennis [ianthi-], Australia, *aterrima*, Madagascar, *semistriata*, Senegal, *capreola*, Ceylon, *dytiscoides*, Venezuela, *flavicornis*, Cuba, and *H. (P) sanguinipennis* and *indica*, East Indies, id. *ibid.*; *H. celeba* [-bensis], p. 177, Celebes, *crassicornis*, p. 178, Tahiti, id. l. c. : spp. nn.

Scaphodema phalacroides, Venezuela, *nitidum*, Yucatan, p. 170, *irradians* (Lacordaire), Cayenne, *tergo-cinctum*, Guatemala, *proximum*, Mexico, p. 178, spp. nn., id. l. c.

Cosmonota sex-vittata (p. 178) and *rubripennis*, Brazil, *nigripes*, *geminata*, and *grammica*, Mexico, spp. nn., id. l. c. p. 173 (the last two referred to *Hapsida*, p. 178; the former is a var. of the latter, p. 182).

Hapsida œneo-micans, sp. n., id. l. c. p. 173, Mexico.

Platydemia punctato-striatum, *basicorne*, and *flexuosum*, Cuba, *rubidum*, Chili, *agile* (Lac.), Mexico (Cayenne and Colombia, p. 187), p. 178, *bisignatum*, *sexpunctatum*, and *erythropterum* [? *erythropt-*], p. 181, *cruciatum*, *serripes*, *opacum*, and *capitosum*, Colombia (*erythropterum* and *cruciatum* also from Mexico, and the latter is a *Scaphodema*, p. 187), and *tenuicorne*, Venezuela, p. 182, *luna*, *angulatum*, *sobrinum*, *rotundatum*, *ferrugineum*, *ventrale*, *monilicorne*, *ornatum*, p. 186, Mexico, id. l. c.; *P. cæsifrons* [? De Marseul], Nouv. et faits (2), No. 9, p. 38, Egypt : spp. nn.

Ulomides.

Uloma culinaris, p. 105, (and pupa), *Lyphia ficicola*, Muls., p. 123, figs. 304–309 (parasitic on *Sinoxylon dentatum*), *Hypophlæus castaneus*, p. 125, *H. fasciatus*, p. 127 (and pupa), larvæ described; Perris, l. c.

Cataphronetis tenuis, Jeddah, *apicilævis*, Port Said, spp. nn. [? De Marseul], Nouv. et faits (2), No. 9, p. 36.

Uloma cypriotes [? id.], l. c. p. 40, Cyprus; *U. bituberosa*, T. Kirsch, MT. Mus. Dresd. Heft ii. p. 145, Mafoor, spp. nn.

Corticeus hopffgarteni, Reitter, Verh. Ver. Brünn, xv. p. 26, pl. i. fig. 8, Szombatsag, S. Hungary; *C. mexicanus*, p. 191, Mexico, *cylindricus*, p. 192, Colombia, id. Verh. z.-b. Wien, xxvii. : spp. nn.

Palorus delicatulus, sp. n., *id.* MT. Münch. ent. Ver. i. p. 140, East India.

Achthosus pascoei, sp. n., T. Kirsch, MT. Mus. Dresd. Heft ii. p. 144, Jobi.

Toxicum rufipes, sp. n., *id.* l. c. p. 145, New Guinea.

Tenebrionides.

Schedarosus, Reitt. [described as between the *Cucujides* and *Brontides*], = *Sitophagus*, Muls., which is cosmopolitan; Reitter, MT. Münch. ent. Ver. i. p. 8.

Teles, g. n., E. Mulsant & A. Godart, Ann. Soc. Linn. Lyon (n.s.) xxii. [for 1875, published in 1876], p. 181. Near *Calcar*. For *Tales* [sic] *eutymi*, sp. n., p. 182, Asia Minor.

Sitophagus turcicus, p. 8, Balkans, *castaneus*, p. 9, Mexico, *cavifrons*, p. 10, Venezuela, spp. nn., Reitter, l. c.

Dolichoderus atro-anesens, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 137, Madagascar.

Nycteropus lavisternus, sp. n., *id.* *ibid.*, Madagascar.

Cyphaleides.

Marodes (misprinted *Marodes*), g. n., O. O. Waterhouse, Ent. M. M. xiv. p. 72. Between *Anausis* and *Lygestira*. For *Prophanes westwoodi*, MacLeay.

Crypsis, g. n., *id.* l. c. p. 73. Near *Chartopteryx*, but with different antennæ. *Cr. violacipennis*, sp. n., p. 74, Laos.

Cyphaleus ereus, sp. n., *id.* l. c. p. 72, Brisbane.

Lygestira lata, sp. n., *id.* *ibid.*, E. Australia.

Artactes guttifer and *lepidus*, spp. nn., *id.* l. c. p. 73, Java.

Onodalonides.

Porphy[r]o[hyba], g. n., L. Fairmaire, Pet. Nouv. ii. p. 137. Very near *Tetraphyllus*, but more contracted, last five joints of antennæ wide, &c. For *P. violaceicolor*, sp. n., *ibid.*, Madagascar.

Camaria parvicollis and *obscurina*, spp. nn., *id.* *ibid.*, Madagascar.

Tetraphyllus oblongo-camelus and *pyropterus*, spp. nn., *id.* *ibid.*, Madagascar.

Helopides.

ALLARD, E. Révision des Hélopides vrais. MT. schw. ent. Ges. v. pp. 13-268.

Having in the preceding year published [Zool. Rec. xiii. *Ins.* p. 68] a similar treatise, the author now discusses the subject at greater length. Synoptical tables of genera and species are given, followed by full descriptions of the species. *Coscinopter*, All. (L'Ab., 1876, p. 4), is now written *Coscinoptilis*, pp. 16, 33, & 127, and [*H*] *Omalus*, written [*H*] *Omales*, p. 151. All the new genera and species diagnosed in the publication referred to are now fully characterized. Much synonymy is given, especially of Küster's species. *Nalassus fuscus*, All., = *Xanthomus æmulus*, Küst.; *Od[ont]ocnemis caudatus*, All., = *prælongus*, Baudi.

Helops cæruleus, p. 131 (and pupa), fig. 310, *H. assimilis*, Küst., p. 132, *H. pellucidus*, Muls., p. 133, larvæ described; Perris, l. c.

Helops coriaceus, Küst., var. n. *cordicollis*, p. 32, Spain; *H. (Eubæus) tentyrioides*, Küst., nec Mén. (*Hedyphanes*), renamed *parvicollis*, p. 131; F. Baudi, Bull. Ent. Ital. ix.

Hedyphanes helopinus, Gemm. (*helopioides*, Luc., = (*Helops*) *terreni*, Friv.; J. Frivaldszky, Term. füzetek, 1877, p. 136.

New species :—

Allard, l. c., describes the following :—

Entomogonus haaghi [sic], p. 68, Cairo, Syria, *fausti*, p. 255, Mesopotamia.

Helops micantipennis [L'Ab. 1876, p. 55], p. 75, Portugal, *fusiformis*, p. 76, Turkey, *myops* [l. c. p. 50], p. 81, Bitlis, *granipennis* [l. c. p. 51], p. 93, European Turkey, *dorsalis*, p. 97, "Kisyl-Aole," *cyanipes*, p. 256, Beyrut.

Xanthomus tingitanus, p. 116, Tangiers, *clavicornis*, p. 118, Kurdistan, Tiflis, *ovipennis*, p. 123, Point Scropha, Mediterranean.

Stenomax incultus, p. 132, Kütlok, *recticollis* [l. c. p. 53], p. 138, Armenia, *crenato-striatus*, p. 146, Trebizond, Patras, *æneipennis* (Mill.), p. 146, Rhodes, *sareptanus* [l. c. p. 53], p. 147, Sarepta, *bosphoranus* [l. c. p. 56], p. 149, Constantinople, *pulcher*, p. 256, Transcaucasia, *intricatus*, p. 257, Bulgaria, *S. ([H] Omaleis) lineatus*, p. 259, Astrabad.

Nesotes occidentalis, p. 167, Jamaica.

Diastiscus thalassinus, p. 181, Algeria, *ibericus*, p. 182, Spain, *sumptuosus* [l. c. p. 57], p. 184, Mexico.

Catomus seriatus, p. 189, California, *pilosus* [l. c. p. 48], p. 191, Oran, *puber* [l. c. p. 50], p. 192, Algeria, *henoni* [l. c. p. 49], p. 193, Constantine, *porcatus* (Schauf., MS.), p. 260, New Zealand.

Rhæbosceles obliteratedus [l. c. p. 56], p. 206, Greece.

Cylindronotus flavipes, p. 219, Caucasus.

Nephodes corsicus, p. 222, Corsica.

Hedyphanes lutosus, p. 229, Asia Minor.

Parablops sardiniensis, p. 261, Sardinia.

Eubæus viridis, p. 234, Caucasus.

Tarpela atra [l. c. p. 46], p. 237, *hispidula*, p. 47], p. 238, *ærifera* [p. 47], p. 239, *cisteliformis*, p. 241, *inanis*, p. 262, Mexico, *catenulata*, p. 239, Australia, *cupreo-viridis*, p. 240, Chontales.

Lamperos japonicus [l. c. p. 46], p. 243, Japan (= *Helops brunneus*, Mars., *ibid.*).

Nautes belti, p. 248, Chontales, *rufipes* [l. c. p. 45], p. 249, Cuba.

Hegemona allardi (Haag, MS.) p. 251, Colombia, *furcillatus* (ditto), p. 252, *elongatus* and *retro-dentatus*, p. 253, *compressus*, p. 254, Mexico.

[Of the above species, *Tarpela catenulata*, *Hedyphanes lutosus*, *Catomus seriatus*, and *Helops dorsalis* (p. 97), *Stenomax incultus* and *Eubæus viridis* (p. 98), are diagnosed as new by Allard in Pet. Nouv. ii.]

Læna reitteri, J. Weise, Verh. Ver. Brünn, xv. p. 27, pl. i. fig. 9, Transylvanian Alps and the Banat.

Helops caucasicus, E. Allard, Pet. Nouv. ii. p. 97, Caucasus; *H. monilicornis*, p. 44, Caucasus, *ghilianii*, p. 46, Spain, *subcaneus*, p. 49, Eastern Spain, *prælongus*, p. 101, Damascus and Kurdistan, Baudi, Bull. Ent. Ital. ix.

Hedyphanes convexifrons, Fairmaire, Pet. Nouv. ii. p. 141, Algeria.

Apolites grævus, G. Kraatz, Deutsche E. Z. 1877, p. 304, Athens.

Amarygmides.

Amarygmus foveo-seriatus, Fairmaire, *l. c.* p. 187, New Britain; *A. haagi*, T. Kirsch, MT. Mus. Dresd., Heft ii. p. 146, New Guinea: spp. nn.

Strongyliides.

Strongylium lævicolle, sp. n., Kirsch, *ibid.*, Jobi.

F. BAUDI DI SELVE, Deutsche E. Z. 1877, pp. 385-416, continues his elaborate critical examination of the European species of *Heteromera* in Dejean's Catalogue [Zool. Rec. xii. p. 332, & xiii. *Ins.* p. 63], discussing the *Cistelidae*, *Pythidae*, *Melandryidae*, *Lagriidae*, and *Peditidae*. As before, species not in this Catalogue are also discussed and described. This portion is also practically repeated, with the addition of the *Anthicidae* and *Pyrochroidae*, by the same author in his "Eteromeri delle Famiglie susseguenti a quella dei Tenebrioniti nei limiti della Fauna Europea e circum-mediterranea." Atti Acc. Tor. xii. pp. 571-729. The observations in Zool. Rec. xiii. *Ins.* p. 63, as to unnecessary double publication of species by this author also apply here.

CISTELIDÆ.

Cistela, *Byrrhus*, and *Anobium*. Crotch's proposed alterations objected to; E. v. Harold, MT. Münch. ent. Ver. i. p. 120.

Megischia elongata, Mén., a good species, and recharacterized; J. Faust, Hor. Ent. Ross. xii. p. 317.

Mycetochares barbata, p. 134 (and pupa), figs. 311-317, *Allecula morio*, p. 137, fig. 318, larvæ described; Perris, *l. c.*

Licymnius strigicollis, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 167, Peak Downs, Australia.

Anaxo fusco-violaceus, sp. n., *id. ibid.*, Rockhampton, Australia.

Allecula orientalis, p. 318, Derbent, *basalis*, p. 320, North of Derbent and Shahrud, *castanea*, p. 323, Samara, spp. nn., Faust, *l. c.*

Heliotaurus grilati, sp. n., E. Mulsant & A. Godart, Ann. Soc. Linn. Lyon (n.s.) xxii. [for 1875, published in 1876] p. 255, Algeria.

Cistela scutellaris, sp. n., F. Baudi, Deutsche E. Z. 1877, p. 388 (also in Atti Ac. Tor. xii. p. 582), Piedmont.

Mycetochares ruficollis (Abeille, MS.), sp. n., *id. l. c.* p. 391 (and *l. c.* p. 589), Syria.

- Cteniopus neapolitanus*, p. 393 (and p. 592), Naples, *gibbosus*, p. 394 (and p. 594), Beirut, spp. nn., *id. l. c.*
Podonta dalmatina, p. 395 (and p. 597), Dalmatia, *italica*, p. 397 (and p. 599), Central Italy, spp. nn., *id. l. c.*
Homophlus melitensis, p. 400 (and p. 607), Malta, *baudueri*, p. 401 (and p. 606), Syria, spp. nn. *id. l. c.*

MONOMMATIDÆ.

- Monomma sudanicum*, sp. n., p. 516, and var. *heydeni*, p. 517, P. V. Gredler, Verh. z.-b. Wien, xxvii., Khartum, with ants.

PYTHIDÆ.

- Pytho depressus*. On its extreme variability; J. Faust, Hor. Ent. Ross. xii. p. 315.
Lissodema denticolle; larva and pupa described; Perris, *l. c.* p. 140, figs. 319-327.
Lissodema japonum, sp. n., E. Reitter, Deutsche E. Z. 1877, p. 382, Japan.
Salpingus palpalis (Truqui, MS.), sp. n., F. Baudi, Deutsche E. Z. 1877, p. 406, note (also in Atti Acc. Tor. xii. p. 615), Cyprus.

MELANDRYIDÆ.

- Phlecotrya vaudoueri*, Muls., p. 145 (and pupa), figs. 329-337, *Anisoxya fuscula*, p. 148 (and pupa), figs. 338 & 339, *Melandrya caraboides*, p. 151 (and pupa), *Tetratoma baudueri*, Perris, p. 151 (and pupa), *Marolia variegata*, p. 157 (and pupa), fig. 340, *Zilora ferruginea*, p. 159, fig. 341, *Dircæ 4-guttata*, p. 161, larvæ described; Perris, *l. c.*
Phryganophilus ferrugineus, Gredl., = *Dircæ parreyssi*, Muls.; *P. sutura*, Gredl., = *D. livida*, Sahlb.; L. V. Heyden, Nouv. et faits, 1877, p. cxxvii.
Osphya bipunctata, small specimens with colour of ♂ and form of ♀; A. Matthews, Ent. M. M. xiv. p. 39.
Opsionus, g. n., F. Baudi, Deutsche E. Z. 1877, p. 409, note. Near *Marolia*; no differential characters given. *O. krueperi*, sp. n., *id. ibid.*, Attica (also in Atti Ac. Tor. xii. p. 629).
Tetratoma crenicollis, sp. n., *id. l. c.* p. 407 (also *l. c.* p. 620), Cyprus.
Eustrophus macrophthalmus, sp. n., E. Reitter, Deutsche E. Z. 1877, p. 383, Japan,
Zilora nuda, sp. n., Provancher, Nat. Canad. ix. p. 321, Canada.

LAGRIIDÆ.

- Lagria parvula*, Perr., = *rubida*, Graells, ♂; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.
 1877. [VOL. XIV.]

PEDILIDÆ.

Scryptia minuta; larva, pupa, and economy in connection with ants in rotten wood described: É. Perris, *l. c.* p. 181, figs. 371-379.

Pedilus errans, sp. n., J. Faust, *Hor. Ent. Ross.* xii. p. 323, Schahdag.

Isehalia basalis, sp. n., C. O. Waterhouse, *Ent. M. M.* xiv. p. 28, Java.

Macratrria exilis, F. P. Pascoe, *Ann. N. H.* (4) xix. p. 147, Tairua, New Zealand; *M. verticalis*, D. Sharp, *Ent. M. M.* xiv. p. 9, Auckland, New Zealand (= *M. exilis*, Pasc.; *id. l. c.* p. 39); *M. japonica*, E. v. Harold, *Deutsche E. Z.* 1877, p. 359, Tokio: spp. nn.

Xylophilus minor, F. Baudi, *Atti Acc. Tor.* xii. p. 640, Piedmont, *cyprius*, *id. l. c.* p. 641, and *Deutsche E. Z.* 1877, p. 414, Cyprus: spp. nn.

Scryptia thoracica, sp. n., *id.* *Deutsche E. Z.* 1877, p. 413 (and *Atti Acc. Tor.* xii. p. 649), Tangiers.

ANTHICIDÆ.

Notoxus appendicinus, Desbr., = *bicoronatus*, Bed., = *hispanicus*, Mots., = *eccisus*, Küst., = *mauritanicus* (Laf.), Luc.; I. Bedel, *Bull. Soc. Ent. Fr.* (5) vii. p. xix.

Cotes, g. n., D. Sharp, *Ent. M. M.* xiv. p. 9. Between *Formicomus* and *Tomoderus*. *C. vestita*, sp. n., *ibid.*, New Zealand.

Anthicodes, g. n., T. V. Wollaston, *Col. St. Hel.* p. 236. Near *Anthicus*, but with longer head, wide, subquadrate thorax, obsolete scutellum and wings, and stouter tarsi. *A. maculatus*, p. 237, *fragilis*, p. 238, spp. nn., St. Helena.

Microhoria, subg. n. of *Anthicus*, A. Chevrolat, *Ann. Soc. Ent. Fr.* (5) vii. p. 167. Posterior legs strongly curved and flattened. For *Anthicus ædipus*, Chevr. (pl. iv. fig. 1), *scaurus* and *valgus*, Fairm., and *M. succincta*, sp. n., p. 169, Constantine.

Notoxus bipunctatus, sp. n., Chevrolat, *Bull. Soc. Ent. Fr.* (5) vii. p. 9, Porto Rico.

Mecynotarsus macularis, sp. n., F. Baudi, *Atti Acc. Tor.* xii. p. 661, Jaffa.

Anthicus læviceps, p. 688 (separated from *antherinus*), Central Italy and S. France, *callinus*, p. 700, S. Spain, *baudieri*, p. 701, *tenuatus*, p. 712, and *leprieuri*, p. 717, Oran, *dolichocephalus* and *pumilus*, p. 702, *oberthuri*, p. 709, Algeria, spp. nn., *id. l. c.*

MORDELLIDÆ.

Didclidia lætula, Lec., found in a cave at Manitou, Colorado, and a larva referred to it described and figured; A. S. Packard, *Bull. U. S. Geol. Surv.* iii. pp. 168 & 169, fig. 9.

Tomozia biguttata, p. 165 (and pupa), figs. 342-351, *Mordellistena micans*, Germ., p. 168 (and pupa), figs. 352-356, *M. inæqualis*, Muls., p. 170, fig. 357, *M. pumila*, p. 171, figs. 358-361, *M. perrisi*, Muls., p. 175, *Anaspis flava*, p. 175 (and pupa), figs. 362-370, larvæ described, with observations on those of allied species; Perris, *l. c.*

Mordella felix, sp. n., C. O. Waterhouse, Ann. N. H. (4) xix. p. 256, Tasmania.

RHIPIDOPHORIDÆ.

Emenadia melanoptera, sp. n., A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. ix., Porto Rico.

Rhipidius primordialis, sp. n., J. P. E. F. Stein, MT. Münch. ent. Ver. i. p. 29, in amber, Ostseestrände.

STYLOPIDÆ.

On the adult larvæ of this family and their puparia; Sir S. S. Saunders, Tr. E. Soc. 1877, pp. 195-197. Notes by J. O. Westwood, l. c. pp. 197-199, pl. vi.

Triæna tertiaria, Menge. Observations on this species, found in amber; Ent. M. M. xiv. p. 18.

Colacina, g. n., J. O. Westwood, Tr. E. Soc. 1877, p. 186, for *C. insidiator*, sp. n., *id. ibid.*; names (only) proposed for portions of the pupa of a Strepsipterous parasite upon the Homopterous *Epora subtilis*, Walk., from Sarawak (forming the *Homopterobie* of S. S. Saunders), figured, pl. iv.

CANTHARIDÆ.

RILEY, C. V. On the larval characters and habits of the Blister-beetles belonging to the genera *Macrobasis*, Lec., and *Epicauta*, Fabr.; with remarks on other species of the family *Meloidæ*. Tr. Ac. St. Louis, iii. pp. 544-562, pl. v. and figs. 35-39.

After a summary of the published accounts bearing upon the early economy of these insects, the author gives a short history of *Meloe*, figuring and describing in detail the first larva and imago of a Californian species, probably *M. barbarus*, Lec.: the jaws of this larva are not articulate in themselves, the antennæ are three-jointed, and the first pair of stigmata are distinctly dorsal and mesothoracic. *Meloe* is only parasitic on hive-bees as it is on any other flower-frequenting insects, and cannot well breed in the cells of any social bee of which the young are fed in open cells. A similar short account is given of *Sitaris* (with figures; after V. Mayet).

The blister-beetles are discovered to be parasitic in their early stage upon the eggs of the "Rocky Mountain Locust," *Culeptenus spretus*, and *C. differentialis*, from egg-pods of the former of which have been reared the unicolorous form of *Epicauta cinerea*, Forst. (which Riley evidently does not think is specifically identical with *E. marginata*, F.), *E. pennsylvanica*, Deg., and *Macrobasis unicolor*, Kby., with var. *murina*, Lec.; *Epicauta vittata*, F., and *marginata*, F., have also been easily reared from locust-eggs. A full account is given of the hyper-metamorphoses of these species, the triungulins of which are larger and more spinose than those of *Meloe* or *Sitaris*, with unequal thoracic joints, powerful man-

dibles and maxillæ, shortened labrum, slender femora, well-armed tibiæ, and less perfect claws. The second larva undergoes four moults, and takes the same food as the first; its skin is almost entirely cast from the coarctate larva, and its subsequent changes are entirely free of the shell of that form. All the stages, with details, are excellently figured from the author's designs.

Meloe angusticollis makes its appearance in the perfect state about the end of August or beginning of September; later in the season the sexes pair, and sometimes as late as after the first frost, the ♀ deposits her eggs and dies. The larvæ emerge from the eggs early the following spring, and probably attach themselves to bees on the blossoms of the willow, being also found in flowers of *Caltha*. W. Brodie, *Canad. Ent. ix. p. 11*. It eats *Anemone* in October; C. D. Zimmerman, *tom. cit. p. 140*.

Notes on some species of *Meloe* occurring in temperate north-eastern America, by F. B. Caulfield, *tom. cit. pp. 75-80*. Brodie's notes (*suprà*) are supposed to refer to *M. americanus*.

Cantharis vesicatoria. Note on metamorphoses; J. Lichtenstein, *CR. lxxxv. p. 628*. The larvæ in their second form reared on honey; *id.* *Ent. M. M. xiv. p. 118*; MT. schw. ent. Ges. v. p. 297; *Bull. Soc. Ent. Fr. (5) vii. p. clxxxvii*. On its occurrence at Norwich; R. Iaddiman, *Ent. x. p. 255*.

Cantharis (Epicauta) tomentosa, Mäkl., var. n. *maklini*, P. V. Gredler, *Verh. z.-b. Wien, xxvii. p. 519*, note, Khartum.

Cantharis flavipes, Muls., var. n. *gentilis*, J. Frivaldszky, *Term. füzetek, 1877, p. 136*.

Cœnas luctuosus, Tauscher, referred to *Halosimus*, and redescribed; J. Faust, *Hor. Ent. Ross. xii. p. 325*.

Halosimus syriacus, L., var. n. *nigricollis*, Frivaldszky, *l. c. p. 136*, Corfu.

Sitaris colletis, Mayet. Its metamorphoses described; *Nouv. et faits (2), No. ix. pp. 33-35, No. x. pp. 37 & 38*.

Sitaris parasitic on a small *Colletes*, and provisionally named *mulsanti*; J. Lichtenstein, *MT. schw. ent. Ges. v. pp. 298 & 302*.

Hornia, g. n., C. V. Riley, *Tr. Ac. St. Louis, iii. p. 564*. Allied to *Megetra* (*Pseudomeloe*, Fairm.) in its elytra being divergent from the scutellum, but differing from all other *Meloides* in having the elytra as rudimentary in both sexes as in *Lampyris noctiluca*, ♀, and in its entirely simple claws. A table of the N. American genera, with figures of their claws given, p. 565, fig. 40 A-G. For *H. minutipennis*, sp. n., p. 564, pl. v. fig. 13 A-D, in cells of *Anthophora sponsa*, Smith, at St. Louis, Missouri. Approaches *Sitaris* in the ultimate stage of second and coarctate larva and in the pupa.

Lyttonyx, g. n. [anon., ? De Marseul], *Nouv. et faits (2), No. 9, 1876, p. 36* [published with L'Ab. xvi. 1877; dated No. 198, January 30, 1878, on cover!]. Tarsal hooks of *Cantharis*, form and facies of *Zonitis*. For "*Cantharis*?" *bilateralis*, sp. n., *l. c. p. 35*, Jeddah.

Meloe specularis, sp. n., P. V. Gredler, *Verh. z.-b. Wien, xxvii. p. 518*, Gondokoro.

Epicauta annulicornis, p. ix., *obscuricornis*, p. x., spp. nn., A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii., Porto Rico.

Palastra eucera, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 167, Gayndah.

Zonitis turcica, p. 84, Brussa, *ruficollis*, p. 85, Crete and Amasia, spp. nn., Frivaldszky, Term. fizetek, 1877.

Hapalus creticus, sp. n., *id. l. c.* p. 83, Candia.

CEDEMERIDÆ.

Cedemera flavipes, p. 187 (and pupa), figs. 380–386, *C. virescens*, p. 190, *Stenostoma rostratum*, p. 192, figs. 387 & 388, larvæ described; É. Perris, *l. c.*

Xanthochroa cyanipennis, Mars., = *waterhousii*, Har.; E. v. Harold, Deutsche E. Z. 1877, p. 360.

Dohrnia miranda, Newm., from Tasmania; C. O. Waterhouse, Ent. M. M. xiv. p. 23.

Oxaxis geniculata, sp. n., A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. x., Porto Rico.

Xanthochroa italica, sp. n., *id.* Pet. Nouv. ii. p. 121, Pisa.

Cedemera basalis, sp. n., *id. ibid.*, Mogador (= *basalis*, Küst.; L. v. Heyden, *l. c.* p. 126).

CURCULIONIDÆ.

Observations by J. Leconte on comparing New Zealand species with those of North America; P. E. Soc. 1877, p. x. Criticisms by F. P. Pascoe, *l. c.* p. xi.

É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. pp. 207–251, gives as a type a detailed description of the larva and pupa of *Balaninus elephas*; followed by a list of references to descriptions of the known larvæ of weevils, and by general observations on the habits of the most salient genera, frequently including specific notices.

Brachyderides.

Dermatodes (Cnecorrhinus) nodosus, Mots., = *casicollis*, Gyll.; E. v. Harold, Deutsche E. Z. 1877, p. 359.

Tanymecus cinereus, Desbr., = *griseus*, Rottb.; *Polydrosus emerii* and *neapolitanus*, Desbr., = *frater*, Rottb.; *P. villosulus*, Chev., is the ♂, and *P. pilosulus*, Chev., and *hirtulus*, Kies., the ♀, of *mollis*, Boh.; *P. convezifrons* and *cephalotes*, Desbr., = *bellus*, Kr.; *P. pallidivestis*, Desbr., = *dilutus*, Mots.; L. v. Heyden, Nouv. et faits, 1877, p. cxxvii.

"*Tainophthalmus*," Desbr., = *Anemerus*, Sch.; *Tanymecus arcuati-pennis*, Desbr., = *Phacephorus vilis*, Fabr. H. Tournier, Bull. Soc. Ent. Fr. (5) vii. pp. xvi.–xviii.

Cyphus hilaris, Perty, is a good species, and a var. of it figured; A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii. p. 170, pl. iv. fig. 3.

Pachyrrhynchus biplagiatus, Guér., pl. xxiv. fig. 3; H. W. Bates, P. Z. S. 1877, p. 154, from Duke of York Island.

Nicaëna, g. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 141. Dubiously considered an ally of *Prosayleus*, but with foveiform scrobes on the apical dorsal surface of rostrum. *N. modesta*, sp. n., p. 142, Otago.

Episomellus, g. n., T. Kirsch, MT. Mus. Dresd., Heft. ii. p. 151. Anomalous in the group, as the antennal furrows are not curved under the eyes, but directed towards their middle, as in the *Episomides*, though the claws are free. Between *Rhinoscapa* and *Celebia*. *E. papuanus*, sp. n., *ibid.*, New Guinea.

Catapionus angulicollis, sp. n., J. Faust, Bull. Mosc. lii. pt. 2, p. 43, Turkestan, Kokand.

Hypomeces inflatus, sp. n., A. Chevrolat, Pet. Nouv. ii. p. 189, New Guinea.

Stigmatotrachelus guttifer, sp. n., C. O. Waterhouse, Ent. M. M. xiv. p. 74, Madagascar.

Cyphus nigro-punctatus, sp. n., A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii. p. 170, pl. iv. fig. 2, Venezuela.

Ezophthalmus olivieri, sp. n., *id. l. c.* p. 171, fig. 4, Santo Domingo.

Rhinoscapa viridula, T. Kirsch, MT. Mus. Dresd., Heft. ii. p. 147, New Guinea; *R. schmeltzi*, L. Fairmaire, Pet. Nouv. ii. p. 185, New Britain: spp. nn.

Eupholus browni, H. W. Bates, P. Z. S. 1877, p. 155, pl. xxv. fig. 2, Duke of York Island; *E. latreillii* and *magnificus*, p. 148, *quadrimaculatus* and *alternans*, p. 149, *admirandus*, p. 150, Kirsch, *l. c.* New Guinea; *E. quinque-fasciatus*, Chevrolat, *l. c.* p. 173, fig. 6, Goram, Moluccas: spp. nn.

Pachyrhynchus verrucatus, sp. n., Bates, *l. c.* p. 154, pl. xxv. fig. 3, Duke of York Island.

Otiorrhynchides.

Otiorrhynchus naudini, Luc., ♀ = *parvicollis*, Gyll.; L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. xx.

Otiorrhynchus ligustici in myriads on clover, near Kulm; Ent. Nachr. iii. p. 171.

Otiorrhynchus sulcatus, from Port Adelaide and Tasmania; Roelofs, CR. Ent. Belg. xx. p. xxxv.

Otiorrhynchus branksiki, Stierl., = *proximus*, Stierl.; Stierlin, Deutsche E. Z. 1877, p. 186.

Micronychus, g. n., L. Provancher, Pet. Faune Ent. Canada, i. p. 508. Differs from *Otiorrhynchus* in the mesothoracic epimera, which separate the episterna from contact with the elytra. *M. sulcatus*, sp. n., *id. l. c.* p. 509, Quebec (= *Cyphomimus dorsalis*, Horn; Provancher, Nat. Canad. ix. p. 323).

Elytrurus expansus, p. 8, *angulatus*, p. 9, *divaricatus* and *serrulatus*, p. 10, spp. nn., C. O. Waterhouse, Tr. E. Soc. 1877, Fiji Islands.

Coptorrhynchus 14-maculatus, sp. n., A. Chevrolat, Pet. Nouv. ii. p. 189, New Guinea.

Sphropteris bituberculatus, sp. n., T. Kirsch, MT. Mus. Dresd., Heft. ii. p. 152, Jobi.

Otiorrhynchus pilicornis, Ferrol, *pachydermus*, Constantine, Chevrolat,

l. c. p. 157; *O. (Tournieria) cylindricus*, p. 177, *raddii*, p. 178, and *schänkerri*, p. 180; *O. decoratus*, p. 179, *simulans*, p. 181, and *bohemani*, p. 184, *Caucasus fabricii*, p. 185, *germari*, p. 187, Dalmatia; *O. (Eurychirus) scabrosoides*, p. 188, Sicily, Stierlin, *l. c.*: spp. nn.

Peritelus caucasicus, sp. n., Stierlin, *l. c.* p. 182, Caucasus.

Mira caucasica, sp. n., *id. l. c.* p. 183, Caucasus.

Trachyphlæus irritus, sp. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 141, Tairua.

Phyllobius deyrollei, p. 4, Persath and Ratcha, *maculatus*, p. 5, and *anomastus*, p. 8, Sunzal, North Russia, *illibatus*, p. 6, Amur, *gyllenhali*, p. 7, Hungary, spp. nn., H. Tournier, MT. schw. ent. Ges. v.

Eremnides.

Elytrocallus montrouzieri (pl. iv. fig. 5) and *humeridens*, spp. nn., A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii. p. 172 (*E. chevrolati*, Montr., re-described), New Caledonia.

Byrsopides.

Rhytidorrhinus singularis, sp. n., L. Fairmaire, Pet. Nouv. ii.*p. 145, Tangiers.

Rhyparasomatides.

Epitimes, g. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 143. Allied to *Dysostines*, but with anterior cotyloid cavities not separated, and elytra laterally deflexed. *E. lutosus*, sp. n., *ibid.*, New Zealand.

Erymneus, g. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 143. Allied to *Styphlus*, &c., but with foveiform scrobes. *E. sharpii*, sp. n., p. 144, Tairua.

Styphlus uncatus, sp. n., J. Frivaldszky, Torm. füzetek, 1877, p. 228, Mehadia, S. Hungary, and Slavonia.

Cylindrorrhinides.

Steriphus veneris, p. 168, *opacus*, p. 169, spp. nn., T. Kirsch, Deutsche E. Z. 1877, Auckland Isles.

Molytides.

Lyperobius tuberculatus, sp. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 142 New Zealand.

Tanyrrhynchides.

Nesiotes barbatus, p. 161, *fimbriatus*, p. 162, *breviusculus*, p. 163, *gracilis* p. 165, *minor* and *simplex*, p. 166, *ascendens*, p. 169, spp. nn., T. V. Wollaston, Col. St. Hel., St. Helena.

Gonipterides.

Haplopus glaucus, sp. n., A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. clxvi., Cayenne.

Hyperides.

Tylopterus leucozona, sp. n., *id. ibid.*, S. Brazil.

Cleonides.

Cleonus bugiensis, sp. n., E. Mulsant & A. Godart, Ann. Soc. Linn. Lyon (n.s.) xxii. [for 1875, published in 1876], p. 256, Bougie, Algeria.

Lixus monticola, sp. n., T. Kirsch, MT. Mus. Dresd., Heft ii. p. 152, Mt. Arfak, New Guinea.

Hylbiides.

Eiratus, g. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 142. Allied to *Hylbius*, but with longer metasternum. *E. parvulus*, sp. n., p. 143, Tairua.

Eirrhinides.

Dicranthus vittatus, Mots., probably = *Bagous elegans*, F.; and *Anacodetes*, Bris., must in that case fall; J. Faust, Bull. Mosc. lii. pt. 2, p. 40.

Peristoreus, g. n., T. Kirsch, Deutsche E. Z. 1877, p. 170. *Storeides*: facies of *Dorytomus*, apparently allied to *Xeda*, Pasc. *P. innocens*, sp. n., p. 171, Auckland Isles.

Neomycta, g. n., F. P. Pascoe, Ann. N. H. (4) xix. p. 145. Differs from *Eirrhinus* in its broad rostrum, with antennæ inserted near the apex. *N. pulicaris*, sp. n., *ibid.*, Tairua.

Eirrhinus viridis, L. Provancher, Pet. Faune Ent. Canada, i. p. 518, Quebec (= *Phytonomus nigrirostris*, F.; *id.* Nat. Canad. ix. p. 324); *E. gracilentus*, L. Fairmaire, Pet. Nouv. ii. p. 145, Biskra; *E. glottis*, Otago, *limbatus*, Tairua, Pascoe, l. c. p. 144: spp. nn.

Dorytomus trilobus, sp. n., Pascoe, l. c. p. 145, Tairua.

Cyrtalia depressirostris, sp. n., T. Kirsch, Deutsche E. Z. 1877, p. 169, Auckland Isles.

Eugnomus wakefieldi, p. 145, Christchurch, *fucosus*, p. 146, Tairua, spp. nn., Pascoe, l. c.

Ambatides.

Ambates fasciolatus and *bisignatus*, p. 341, Mexico, *ambitosus* and *tergo-signatus*, p. 342, Cayenne, *simulans*, p. 342, S. America, *putzeysi*, *justini*, and *bicircinatus*, p. 343, *thoracicus* and *vestitus*, p. 344, Columbia, *hilipoides*, p. 343, Teapa, *quadrinotatus*, p. 344, Bolivia, *ephippium*, *callinotus*, and *elongatus*, p. 345, and *A. ? litura*, p. 346, Brazil, spp. nn., A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii.

Belides.

Pachyura metallica, sp. n., Pascoe, l. c. p. 146, New Zealand.

Apionides.

A list of the leaves, flowers, fruit, and galls of plants frequented by various species of *Apion*; E. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. pp. 232-237.

Attelabides.

Apoderus (Centrocornus) raelofsi, sp. n., E. v. Harold, Deutsche E. Z. 1877, p. 358, Hakone Mts., Japan.

Otidocephalides.

Otidocephalus grandis, p. 174, pl. iv. fig. 7, *cupreus* and *pellitus*, p. 175, *canus*, *senex*, and *lineipennis*, p. 176, *albo-marginatus*, p. 177, Mexico, *tergo-pilosus*, p. 175, *elongatus*, p. 177, Brazil, spp. nn., A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii. (table of dimensions of 13 spp., pp. 178 & 179).

Balaninides.

Perris, l. c. p. 207 *et seq.*, gives a detailed description of the larva and pupa of *Balaninus elephas*.

Prionomerides.

Piazorrhinus monographed; A. Chevrolat, Ann. Soc. Ent. Fr. (5) vii. pp. 97-100.

Piazorrhinus senilis, p. 97, *leucaspis*, *rubidus*, *sahlbergi*, and *erythropus*, p. 98, *rufrostris* and *ephippiatus*, p. 99, Brazil, *pleuroleucus* and *corpulentus*, ibid., *flavitarsis* and *alticollis*, p. 100, New Granada, spp. nn., id. l. c.

Tychiides.

Pachytychius transversicollis, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 145, Lambassa.

Sibynes creto-sparsus, sp. n., id. ibid., Biskra.

Cionides.

Nanophyes komaroffi, sp. n., J. Faust, Bull. Mosc. lii. pt. ii. p. 41, Derbend.

Nerthopides.

Acallopiatus franciscanus, sp. n., P. V. Gredler, Verh. z.-b. Wion, xxviii. p. 520, Schendy, Upper Nile.

Cryptorrhynchides.

Orobitis cyaneus in seeds of *Viola palustris*; A. Puton, Bull. Soc. Ent. Fr. (5) vii. p. cxxx.

Acalles stridulating; F. Smith, P. E. Soc. 1877, p. xxxiii. [*cf.* Wolaston on certain musical *Curculionidæ*, Ann. N. H. vi. 1860, p. 14].

New genera and species:—

Trichocaulus, L. Fairmaire, Pet. Nouv. ii. p. 98. Near *Desmidophorus*. For *T. longipilis*, ibid., Biskra.

Conopsis, A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. cxvii. No differential characters given. For *Orobitis* ? *gibbosa*, Montr., and *C. dispar* and *C. ? maculipes*, p. cxviii., New Caledonia.

Acallopius, F. P. Pascoe, Ann. N. H. (4) xix. p. 147. Differs principally from *Acalles* in the cavernous pectoral groove, terminated by the raised border of the mesosternum. *A. rudis*, ibid., Tairua.

Dyspeithes [*-pithes*], T. Kirsch, MT. Mus. Dresd., Heft ii. p. 153, *Euthyrhinus* group: scape very short, reaching not nearly to the eye, legs very short, intermediate tibiæ strongly toothed externally. *D. dentifer*, ibid., Mafoor.

Parentymia, id. l. c. p. 154. Next to *Endymia*, Pasc., but with second

abdominal segment longer than third and fourth together, eyes not approximated in front, straight tibiae, transverse almost rectangular thorax, and parallel elytra. *P. pilipes*, *ibid.*, Jobi.

Thriconotus [rectius *Trico-*; || Mulsant, *Col.*, 1842; Schnieder, *Pisces*, 1801], A. Chevrolat, *Ann. Soc. Ent. Fr.* (5) vii. p. 103. For *Cryptorrhynchus setiferus*, Boh., and *setarius*, J. Thoms.; also *T. erectisetis*, Senegal, and *succinctus*, Guinea, p. 104.

Diplogrammus, *id. l. c.* p. 180. No differential characters given. For *Cryptorrhynchus 4-vittatus*, Ol., *C. amoenus*, Chevr., *C. 6-lineatus*, Boh., and *D. maculipes*, p. 181, *imperfectus* (pl. iv. fig. 8) and *novem-lineatus*, p. 182, Brazil.

Ocladius holomelas, L. Fairmaire, *Pet. Nouv.* ii. p. 98, Algeria.

Acalles planidorsis and *kronii*, T. Kirsch, *Deutsche E. Z.* 1877, p. 172, Auckland Isles; *A. impeus*, p. 146, *perpusillus*, p. 147, Pascoe, *l. c.*, New Zealand.

Euthyrrhinus frontalis, T. Kirsch, *MT. Mus. Dresd.*, Heft ii. p. 152, New Guinea.

Blepiarda marmorata, *id. l. c.* p. 155, New Guinea.

Protopalus albo-guttatus, A. Chevrolat, *Pet. Nouv.* ii. p. 189, New Guinea.

Perissops pavonius, *id. ibid.*, New Guinea.

"*Petomis*" [*? Petosiris*] *nigritarsis*, *id. ibid.*, New Guinea.

Zygopides.

Homogaster, g. n., L. Provancher, *Pet. Faune Ent. Canada*, i. p. 530. *H. quebecensis*, sp. n., *id. ibid.*, Quebec (= *Piazurus subfasciatus*, Lec.; *id. Nat. Canad.* ix. p. 327).

Arachnopus compressipes, New Guinea, *rotundipennis*, Celebes, spp. nn., A. Chevrolat, *Pet. Nouv.* ii. p. 189.

Ceuthorrhynchides.

Ceuthorrhynchus sulcicollis. Galls in cabbage and turnip roots described and figured; E. A. Ormerod, *Ent.* x. p. 246-249.

Baridiides.

Loboderes, Sch., 1836, clashing with *Loboderus*, Guér. (*Elateridae*), 1831, is renamed *Epilobaspis*, p. 101, with *E. catoleucus*, S. Brazil, *maculiventris* and *duplex*, Guiana, p. 102, spp. nn.; A. Chevrolat, *Ann. Soc. Ent. Fr.* (5) vii.

Calandridides.

Rhynchophorus pascha, Schön., var. n. *papuanus*, New Guinea; T. Kirsch, *MT. Mus. Dresd.*, Heft ii. p. 156.

Sphenophorus striatus, Fahr., destroying bananas in Madeira; T. V. Wollaston, *Ann. N. H.* (4) xx. p. 334.

Trochor [*r*] *hopalus*, g. n., T. Kirsch, *MT. Mus. Dresd.*, Heft ii. p. 156. Antennal scape short, club turbinate. For *Sphenophorus strangulatus*, Sch.

Rhynchophorus velutinus, sp. n., L. Fairmaire, Pet. Nouv. ii. p. 185, New Britain.

Sphenophorus nudicollis, sp. n., Kirsch, l. c. p. 156, Mysol.

Cossonides.

T. V. Wollaston, Col. St. Hel., describes the following new genera and species from St. Helena :—

Pseudostenocelis, p. 84. Very like *Stenocelis*, but with five-jointed funiculus. For *P. sculpturata*, p. 86, *asteriperda*, p. 87, *longitursis*, p. 88, *alutaceicollis*, p. 89, *compositarum*, p. 90, *minima*, p. 91.

Pachymastax, p. 91. Allied to the preceding, but with eyes sub-superior, not lateral, and elytra not asperate behind. *P. crassus*, p. 93.

Heceaoptus, p. 95. Of cylindric-fusiform outline, and opaque almost unsculptured surface, with small eyes; funiculus six-jointed, with third joint anomalously increased. *H. ferrugineus*, p. 96.

Pentarthrodes, p. 96. Like *Pentarthrum*, but with obsolete scutellum, very minute eyes, and different rostrum. *P. dicksonie*, p. 97, and *filicum*, p. 98.

Isotornus, p. 104. Between *Pseudomesoxenus* and *Microxylobius*, with short triangular rostrum and very depressed eyes. *I. retractilis*, p. 105, and *aterrimus*, p. 106.

Eucoptoderus, p. 137. Prothorax and rostrum coarsely and densely wrinkled. *E. vermiculatus*, p. 138, and *affinis*, p. 139.

Chalcotrogus, p. 139. Surface partly brilliant and partly opaque; rostrum long and narrow, eyes extremely minute but rather prominent. *C. apion*[o]ides, p. 140, *oblongior* and *semipolitus*, p. 142.

Xestophasis, p. 147. Rostrum basally strangulate, superiorly gibbose, anteriorly decurved. *X. nasalis*, p. 149.

Tapirominus, p. 149. With opaque setose surface, rostrum gibbous and strongly arcuate-deflexed. *T. gibbistrois*, p. 150.

Tychior[r]hinus, p. 151. Differs from the preceding in its slender linear rostrum. *T. variolosus*, p. 152, *porrectus*, p. 153, *inæqualis* and *subochraceus*, p. 154, *lineatus*, p. 155.

Cryptommatæ, p. 156. Prothorax much produced in front, completely concealing the head. *C. cucullata*, p. 157.

Stenoscelis hylastoides, p. 84, fig. 1.

Pseudomesoxenus minutissimus, p. 101, *scrobiculatus*, p. 103.

Microxylobius trituratorus, p. 108, *whiteheadi*, p. 109, *oculatus*, p. 110, *calcarotus*, p. 113, *bisectus*, p. 115, *sculpturatus*, p. 116, *bicaudatus* and *granulosus*, p. 117, *opacus*, p. 119.

Acanthomerus ellipticus, p. 127, *similis*, p. 130, *cylindricus*, p. 132, *asperatus*, p. 134.

Anotheorus, g. n., T. Blackburn, Ent. M. M. xiv. p. 4. In Lacordaire's 'Cossonides vrais': eyes in their entirety visible from above. *A. montanus*, sp. n., id. l. c. p. 5, Oahu, Sandwich Islands.

Oodemus halticoides, sp. n., id. l. c. p. 5, Oahu.

Cossonus cœloderes, sp. n., A. Chevrolat, Pet. Nouv. ii. p. 189, New Guinea.

SCOLYTIDÆ.

A list of references to descriptions of known larvæ, with general observations; É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. pp. 252-256.

Hylesinus fraxini. On its workings; E. A. Ormerod, Ent. x. pp. 183-187, figs.

K. Lindemann, "Monographie der Borkenkafer Russlands. Die Cryphaloiden Tomiciden," Bull. Mosc. lii. pt. 1, pp. 158-187, figs. 56-85 [Zool. Rec. xiii. *Ins.* p. 100], discusses *Stephanoderes alni*, Lind., and *Hypoborus ficus*, Er., in the minutely anatomical style characterizing the author's former work.

Tomicus amitinus and *omissus*: observations by Eichhoff, S. E. Z. xxxviii. pp. 118, 119, 387, & 388. *T. stenographus*, *typographus*, *rectangulus*, *proximus*, *laricis*, *suturalis*, *curvidens*, *bidens*, and *chalcographus*; id. l. c. pp. 386-392.

Pachycotes, g. n., D. Sharp, Ent. M. M. xiv. p. 10. Of doubtful affinities: provisionally placed near *Hylurgus*, but with distinctly coarser granulation to the eyes, and the basal abdominal segment peculiarly prominent, suggesting an early stage of *Scolytus*-differentiation. *P. ventralis*, sp. n., id. *ibid.*, New Zealand.

Tomicus infuscatus, sp. n., Eichhoff, S. E. Z. xxxviii. p. 392, Steiermark.

Dryocates graniceps, sp. n., id. Deutsche E. Z. 1877, p. 120, Japan.

Xyleborus brevis, p. 121, *glabratus*, p. 127, spp. nn., id. l. c., Japan.

BRENTHIDÆ.

Amorphocephalus piochardi, sp. n., L. Bedel, Bull. Soc. Ent. Fr. (5) vii. p. clxxxiv., Syria.

Ectocemus ruficauda, sp. n., H. W. Bates, P. Z. S. 1877, p. 156, pl. xxv. fig. 5, Duke of York Island.

ANTHRIBIDÆ.

Enedreutes oxyacanthæ, C. Bris., p. 195 (and pupa), figs. 389-396, *Choragus sheppardi*, p. 197 (and pupa), fig. 397, *Tropideres albirostris*, p. 200 (and pupa), figs. 398 & 399, *T. sepicola*, figs. 400 & 401, and *T. niveirostris*, figs. 402 & 403, p. 201, *Anthrribus albinus*, p. 202, figs. 404-406, larvæ described; É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii.-

Anthrribus arciferus, Blanch., Voy. Pol sud, referred to *Phlæobius* by Lacordaire, is in error for *Xenocerus albo-lineatus*, Blanch.; T. Kirsch, MT. Mus. Dresd., Heft ii. p. 157.

Aræocerus fasciculatus, Deg., in fruits of *Elaeococca vernicosa* from Cochin China; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. lxxvii.

Acarodes, g. n., T. V. Wollaston, Col. St. Hel. p. 205. Facies of *Xenorchestes*, but with no saltatorial power. *A. gutta*, sp. n., id. l. c. p. 206, St. Helena.

Diastatropis olivaceus, sp. n., C. O. Waterhouse, Tr. E. Soc. 1877, p. 11, Madagascar.

Cratoparis targionii, sp. n., F. Piccioli, Bull. Ent. Ital. ix. p. 214, pl. vii. fig. 1, Florence, probably in *Crategus oxyacantha*.

Parablops (?) *oculatus*, sp. n., Baudi, Bull. Ent. Ital. ix. p. 135, Sicily.

Notioxenus subfasciatus, p. 179, *janischi*, p. 184, *dalii*, p. 185, *grayi*, p. 186, *æneus*, p. 187, *congener*, p. 188, *rotundatus*, p. 190, spp. nn., Wollaston, l. c., St. Helena.

Homœodera elateroides, p. 193, *nodulipennis*, p. 194, *edithia*, p. 195, *major* and *compositarum*, p. 197, *pumilio*, p. 199, *asteris*, p. 202, *paivæ*, p. 203, *globulosa*, p. 205, spp. nn., *id.* l. c., St. Helena.

BRUCHIDÆ.

Bruchus pisi at large in England, on *Sisymbrium*; J. Chappell, Ent. M. M. xiii. p. 181.

A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii., describes the following new species:—

Bruchus melanops, p. lxxxix., Old Calabar.

Caryopemon quadriguttatus, p. xc., Cambodia.

Pachymerus ruficornis, *ibid.*, Mexico, *dimidiaticornis*, Bogota, and *scabricollis*, New Granada, p. xcvi.

Caryoborus giganteus, p. xcvi., Bahia (alive at Rouen), *priocerus* (? = *bactris*, L.), p. xcix., Cayenne, *lacerdæ*, Bahia, and *luteo-marginatus*, Venezuela, p. cvi., *rubidus*, p. cxiv., Mexico, *recticollis*, p. cxv., Caracas.

Spermophagus ano-signatus, Rio Janeiro, *serie-guttatus*, Venezuela, *albo-vittatus*, Bogota, p. cxv., *planifemur*, Mexico, *flavidus*, Brazil, *ligatus*, Nilgherries, p. cxxiv., *posticus*, p. cxxv., Old Calabar.

Urodon lineipennis, p. cxxv., Senegal.

CERAMBYCIDÆ.

THOMSON, JAMES. Typi Cerambycidarum Musei Thomsoniani. R. Z. (3) v. pp. 249–279.

The author substitutes the more logical term “type” for “species,” “variety,” “genus,” &c., which he considers to be purely arbitrary or conventional abstractions. But he takes care, in his descriptions following this opinion, to employ the usual expressions as to new genera and species. He gives a brief account of his collection. The present portion refers to the *Prionides*.

J. C. SCHIÖDTE, Nat. Tids. (3) x. pp. 369–458, pls. xii.–xviii., anatomically describes and figures details of the larvæ of various *Cerambycidæ*, with general description and a morphological conspectus of the different salient features in each. The pupæ of most of these are also described.

Critical observations on various species; C. A. Dohrn, S. E. Z. xxxviii. pp. 395–399.

Prionides.

J. THOMSON, R. Z. (3) v. p. 251 *et seq.*, discusses various groups of this division. Five “sub-types” of *Psolidognathus friendi*, Gr., are named

testaceus, *viridi-obscurus*, *violaceus*, *subniger*, and *ater* (p. 254); *P. boucardi*, Thoms., is fully described, p. 255; it is gravely proposed to call *P. modestus*, Fries, by the name of *mygaloides*, Thoms., and vice versâ, in certain contingencies of synonymy; *P. limbatus*, Tasch., from Colombia, redescribed with the provisional name *castaneipennis*, p. 259; *Prionocalus cacicus* is not from Mexico.

Prionus coriarius. Larva anatomically described and details figured; J. O. Schiödt, Nat. Tids. (3) x. p. 396, pl. xii. figs. 1-12.

Egosoma scabricorne, p. 258, figs. 407-410, and *Tragosoma depsarium*, p. 260 (and pupa), figs. 411-416, larvæ described; E. Perris, Ann. Soc. L. Lyon (n.s.), xxiii.

Egosoma scabricorne. On the trees on which it feeds: H. du Buysson, Pet. Nouv. ii. p. 118; Goubert & Frey-Gessner, l. c. p. 126.

Macrotoma heros, Heer, referred to *Xixuthrus*; J. Thomson, Bull. Soc. Ent. Fr. (5) vii. p. cliv.

New genera and species :—

Acalodegma, Thomson, l. c. p. 261. Type of a new division, *Acalodegmities*, to be placed near Lacordaire's *Micropsalites*, but with the antennæ of ♂ moniliform, longer than the body, the eyes rather approximated, the mandibles exserted, pulpi slender and short, and posterior femora much shorter than the apex of body in both sexes. Unites characters of *Polyarthron*, *Meroscelisus*, *Acanthinodera*, &c. Type, *Aptero-caulus marginipennis*, Fairm., = *Ancistrotus servillii*, Blanch. (? *Acanthinodera bihamatu*, Bates).

Chollides, id. l. c. p. 264. Near *Closterus*, with sub-pectinated antennæ, with longer 3rd joint, and various other differences of degree. *Ch. closteroides*, p. 265, China.

Zelogenes, id. l. c. p. 267. Very like *Cacosceles*, but with antennæ in the ♂ quite different, and scarcely reaching half the length of the elytra. *Z. newmannii* [-mani], p. 268, Diamond Fields, S. Africa.

Paranecus, id. l. c. p. 269. Differs from *Jalyssus* in the mandibles and antennæ, and in the thorax not being crenulated at the sides. *P. olivieri*, p. 270, Parana.

Zooblaz, id. l. c. p. 274. Should found a new group near the *Egosomites*, uniting the characters of *Navosoma*, *Strongylaspis*, &c. *Z. elateroides*, *ibid.*, Andamans.

Navosomopsis, id. l. c. p. 275. Differs from *Aulacopus* in its more slender antennæ and legs, and in the thorax, which is like that of *Navosoma*. For *Aulacopus feisthameli*, Buq.

Aspectrogaster, id. l. c. p. 276. Near *Cnemoplites*, with different antennæ, completely glabrous abdomen, &c. *A. flavipilis*, p. 277, Australia.

Blephylidia (Pasc., MS.), id. l. c. p. 277. Near *Eurynessa*, &c., but with short and slender antennæ in the ♂, &c. *B. jejuna*, Pasc.

Analophus, C. O. Waterhouse, Ann. N. H. (4) xix. p. 423. Closely allied to *Mallodon*, but with thorax not expanded into a lateral ridge. *A. parallelus*, *ibid.*, Queensland.

Enneaphyllus, id. l. c. p. 257. *Tragosomina*, following *Prionoplus*;

antennæ of ♂ lamelliferous from joint 3. For *E. cneipennis*, *ibid.*, Tasmania.

Psalidognathus deyrollei, Thomson, Bull. Soc. Ent. Fr. (5) vii. p. xcvi., Colombia; *P. batesi*, *id.* R. Z. (3) v. p. 257, Panama.

Cyrtognathus falco, p. 262, *zivetia*, p. 263, *id. l. c.*, Himalayas.

Closterus (? g. n.) *janus*, *id. l. c.* p. 263, Madagascar.

Tithoes mandibularis, p. 265, Cape of Good Hope, *intermedius*, Natal, and *arabicus*, Arabia, p. 266, *id. l. c.*

Xizuthrus nycticorax, p. cliv., Australia, *axis*, p. clxvii., Amberbaki (Northern New Guinea), *id.* Bull. Soc. Ent. Fr. (5) vii.; *X. terribilis*, *id.* R. Z. (3) v. p. 269, Fiji.

Navosoma blanchardi, *id.* R. Z. (3) v. p. 270, Brazil.

Macrotoma valida, ? Australia, *cnemoplitoides*, Australia, p. 271, *atroisoptera*, Natal, *sericollis* (Dej.), Java, p. 272, *gregaria* (Dej.), p. 273, Senegal, *id. l. c.*

Strongylaspis costifer, *id. l. c.* p. 275, Maroni, Guiana.

Phyllocnema raffrayi, *id. l. c.* p. 278, Zanzibar coast.

Opheltes cariosicollis, L. Fairmaire, Pet. Nouv. ii. p. 167, Kandaon, Fiji Islands.

Toxotes punctatissimus, Thomson, Bull. Soc. Ent. Fr. (5) vii. p. clv., Australia.

Selenoptera lateralis, A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. xxxi., Porto Rico.

Cerambycides.

J. C. SCHÜDTE, Nat. Tids. (3) x., anatomically describes and figures details of the larvæ of the following species:—*Tetropium luridum*, p. 398, pl. xiii. figs. 1–10 (pupa, p. 444); *T. fuscum*, p. 400; *Criocephalum rusticum*, *ibid.* pl. xiii. figs. 11–19 (pupa, p. 444); *Asemum striatum*, p. 401, pl. xiv. figs. 1–9 (pupa, p. 444); *Cerambyx cerdo*, p. 403, pl. xv. figs. 1–10; *Phoracantha recurva*, Newm., p. 405, pl. xvi. figs. 1–10; *Xystrocera globosa*, p. 406, pl. xiii. figs. 23 & 24; *Stromatium unicolor*, p. 407, pl. xiv. figs. 10 & 11; *Cyrtomerus pilicornis*, p. 409, pl. xiii. figs. 20–22 (pupa, p. 445); *Phenicus sanguinipennis*, Lac., p. 410, pl. xiv. figs. 12–21; *Clytus mysticus*, p. 411, pl. xiv. figs. 22–25 (pupa, p. 445); *C. arcuatus*, p. 413; *Gracilia minuta*, p. 413, pl. xvi. figs. 11 & 12; *Molorchus dimidiatus*, p. 414, pl. xv. figs. 11 & 12; *Callidium variabile*, p. 416, pl. xv. figs. 14–21 (pupa, p. 445); *C. bajulus*, p. 417, pl. xv. fig. 13; *Rhagium mordax*, p. 418, pl. xvii. figs. 1–7 (pupa, p. 445); *R. inquisitor*, p. 419 (pupa, p. 445); *R. bifasciatum* and *indagator*, pl. xvii. figs. 8 & 9 (pupa, p. 446), p. 420; *Toxotus cursor*, *ibid.* pl. xvi. figs. 13–19; *L. 4-fasciata*, p. 422 (pupa, p. 447); *L. testacea*, pl. xvi. fig. 20 (pupa, p. 447), and *L. sanguinolenta*, p. 423 (pupa, p. 447). Pupa of *Leptura scutellata* described, p. 446.

É. PERRIS, Ann. Soc. L. Lyon (n.s.) xxiii., describes and figures details of the larvæ of the following species:—*Cerambyx mirbecki*, Luc., p. 262*, figs. 417–420, *Purpuricenus kœhleri*, p. 263*, figs. 421–426, *Aromia moschata*, p. 266*, figs. 427 & 428, *Phymatodes melancholicus*, p. 270, figs. 430–436, *P. variabilis*, p. 273*, figs. 437 & 438, *Rhopalopus femoratus*, p. 275*, figs. 439–442, *Callidium unifasciatum*, p. 277*, figs. 443–448, *C.*

alni, p. 280*, fig. 449, *Sympiezocera laurasi*, p. 283*, *Stromatium unicolor*, p. 288*, figs. 450-453, *Flagionotus detritus*, p. 291*, figs. 454-460, *Clytus arietis*, p. 293, *C. verbasci*, p. 294*, figs. 461 & 462, *C. 4-punctatus*, p. 295*, figs. 463 & 464, *C. massiliensis*, p. 296, pupa, *C. rhamni*, p. 297, pupa, *Deilus fugax*, p. 299, figs. 464 bis & ter, *Icosium tomentosum*, Luc., p. 302, figs. 465-467, *Gracilia pygmæa*, p. 303, figs. 468-472, *Leptidea brevipennis*, Muls., p. 305, *Stenopterus rufus*, p. 307, figs. 473-475, *Molorchus umbellatarum*, p. 308*, fig. 476, *Vesperus luridus*, p. 356*, figs. 531-537, *Rhagium bifasciatum*, p. 368*, figs. 538-546, *Oxymirus cursor* (?), p. 371, figs. 547-549, *Acmaeops collaris*, p. 373*, figs. 550-555, *Strangalia attenuata*, p. 380, figs. 456-562, *Leptura cincta*, p. 382, figs. 563 & 564, *L. rufipennis*, Muls., p. 383, *Grammoptera ustulata*, p. 384*, figs. 565-573 (pupa also, where marked *).

Alloцерus fulvus, Muls., = *maesiacus*, Friv. (*Callidium*); *Grammoptera nigriflava*, Fuss, is a *Leptura*, very near *rufiventris*, Gebl.; J. Frivaldszky, Term. füzetek, 1877, p. 136.

Grammoptera bicarinata, Arnold, is a *Vadonia*; *Cortodera rufipes*, Ktz., ♀ = *flavimana*, Walzl, var.; *Leptura tesserula*, Charp., var. n. *impunctata*, Caucasus (p. 420); *L. philibensis*, Friv., *nigro-picta* and *trispinata*, Fairm., = *silbermanni*, Lefeb., = *rufa*, Brullé, ♀; with other observations on species from the Caucasus, &c. L. v. Heyden, Deutsche E. Z. 1877, pp. 416-422.

Cortodera beckeri, Desbr., = *Pachyta alpina*, Mén., certe; J. Faust, Hor. Ent. Ross. xii. p. 332, and G. Kraatz, Deutsche E. Z. 1877, p. 422.

Pachyta 6-maculata, L., from Scotland; G. C. Champion, Ent. M. M. xiv. p. 92.

Aromia moschata in Scotland; R. Service, Ent. x. p. 304.

Rosalia alpina, var. from Palermo; L. Reiche, Bull. Soc. Ent. Fr. (5) vii. p. cxviii.

Trachyderes succinctus, a South American species, found in a wood near Arcachon; Guerry-David, Pet. Nouv. ii. p. 107.

New genera and species :—

Jebusæa, L. Reiche, Bull. Soc. Ent. Fr. (5) vii. p. cliii. Near *Xestia*, but with simple antennæ, smooth thorax, apex of elytra not spined, and hind femora as long as the body. *J. hammerschmidtii*, p. cliv., Jaffa.

Allotræus, H. W. Bates, Ent. M. M. xiv. p. 37. *Phorecanthina*, but with the facies of the *Sphæroninæ*. *A. sphæroninus*, ibid., Japan.

Leptoxenus, id. ibid. Allied to the *Eligmodermatina*, but with depressed antenniferous tubers. *L. ibidiiformis*, ibid., Japan.

Drotus, D. Sharp, Ent. M. M. xiii. p. 195. Near *Calliprason* and *Stenopotes*; probably to be placed in one of the first three groups of Lacordaire's Section B. For *D. elegans*, p. 194, New Zealand.

Bradynemis, C. O. Waterhouse, Tr. E. Soc. 1877, p. 11. Characters of *Phyllocnema*, but with thorax rounded laterally. *B. velutina*, E. Indies?, and *anomala*, Penang, p. 12.

Xuthodes apicalis, p. 193, *batesi*, p. 194, Sharp, l. c., New Zealand.

Syllitus bipunctatus, C. O. Waterhouse, Ent. M. M. xiv. p. 75, Queensland.

Leptura latifica, L. Provancher, Pet. Faune Ent. Canada, i. p. 620, Quebec (= *mutabilis*, Newm., var.; *id.* Nat. Canad. ix. p. 332).

Molorchus plagiatus, Reiche, l. c. p. cxxii., Batum.

Merionada musschenbrœki, R. Gestro, Ann. Mus. Genov. x. p. 653, Celebes.

Brachytiria varia, p. 423, Sydney, *picta*, p. 424, Queensland, C. O. Waterhouse, Ann. N. H. (4) xix.

Rosalia batesi, E. v. Harold, Deutsche E. Z. 1877, p. 360, Yesso (allied to *R. alpina*).

Clytellus selebensis, Gestro, l. c. p. 653, Celebes.

Stenaspis plagiata, Waterhouse, Tr. E. Soc. 1877, p. 12, Guatemala.

Lamiides.

J. C. SCHIÖDTE, Nat. Tids. (3) x. anatomically describes and figures details of the larvæ of the following species: *Astynomus ædilis*, p. 424, pl. xvii. figs. 10 & 11 (pupa, p. 448); *Liopus nebulosus*, p. 426, pl. xvii. figs. 12 & 13 (pupa, p. 448); *Exocentrus balteus*, p. 427, pl. xviii. figs. 1 & 2; *Pogonocherus pilosus*, p. 428, pl. xvii. figs. 14-16 (pupa, p. 448); *Morimus lugubris*, p. 429, pl. xvii. figs. 17 & 18; *Parmena rubescens*, Dalm., p. 431, pl. xviii. figs. 3 & 4; *Batocera armata*, p. 432, pl. xviii. figs. 5-8; *Monochamus sartor*, p. 434, pl. xviii. figs. 9 & 10; *Mesosa nubila*, p. 436, pl. xvii. figs. 19 & 20 (pupa, p. 450); *Saperda carcharias*, p. 437, pl. xviii. figs. 11-16 (pupa, p. 450); *S. populnea*, p. 439 (pupa, p. 450); *Stenostola nigripes*, *ibid.* pl. xviii. figs. 17 & 18. He also describes pupæ of *Prosopocera fronticornis* and *Batocera rubus*, p. 449.

É. PERRIS, Ann. Soc. L. Lyon (n.s.) xxiii. describes and figures details of the larvæ of the following species: *Lamia tristis*, p. 314, figs. 477 & 478, *Astynomus atomarius*, p. 316*, figs. 479-482, *Liopus nebulosus*, p. 317*, figs. 484-490, *Acanthoderes varius*, p. 319*, figs. 491-494, *Exocentrus adpersus*, Muls., p. 320*, figs. 495-499 (*E. revelieri*, Muls., *sec. larvam*, = *adpersus*), *Pogonocherus dentatus*, p. 326*, fig. 500, *P. decoratus*, Fairm., p. 327, *P. hispidus*, p. 328, *Mesosa nubila*, p. 331, figs. 501-505, *Albana m-griseum*, p. 333*, figs. 506 & 507, *Anæsthetis testacea*, p. 335*, figs. 508-513, *Tetrops præusta*, p. 337*, figs. 514-517, *Agapanthia asphodeli*, p. 340*, figs. 518-522, *A. angusticollis*, p. 343, *Oberea oculata*, p. 349*, figs. 523-526, *Phytocia lineola*, p. 351*, figs. 527-530 (pupa also, where marked *).

Tmesisternini: R. Gestro, Ann. Mus. Genov. ix. pp. 139-182, enumerates the species of this group found in the Austro-Malayan region by Beccari, D'Albertis, and Bruijn, with tables of their geographical distribution.

Dorcadion amori, Mars., has priority over *D. mus*, Rosenh.; S. A. De Marseul, Nouv. et faits, 1877, p. cxxxvi.

Agapanthia acutipennis, Muls., is distinct from *asphodeli*, Latr.; L. Reiche, Bull. Soc. Ent. Fr. (5) vii. p. cxxviii.

Saperda bivittata, Say. The eggs and method of ovipositing described for the first time; C. V. Riley, Tr. Ac. St. Louis, iii. (Proc.) p. cclxix.

New species:—

Areysia papuana, Gestro, l. c. p. 147, Hatam.

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- Oriniame sulciceps*, p. 149, Salwatty & Ramoi, *xanthostieta*, p. 151, Aru, *id. l. c.*
- Tmesisternus bruini*, p. 154, Salwatty, Sorong, and Ramoi, *viridis*, p. 157, *arfakianus*, p. 158, and *elateroides*, p. 160, Hatam, *geelvinkianus*, p. 159, and *subcinctus*, p. 163, Jobi, *monticola*, p. 161, Mt. Epa, *irregularis*, p. 165, Mansinam, *id. l. c.*
- Arrhenotus humilis*, *id. l. c.* p. 167, Ramoi, &c.
- Pascoea amatiae*, *id. l. c.* p. 171, Ramoi, &c.
- Elaeis bimaculata*, *id. l. c.* p. 173, Ramoi and Andai.
- Batocera browni*, p. 157, pl. xxv. fig. 1, *nebulosa*, p. 158, pl. xxiv. fig. 1, H. W. Bates, P. Z. S. 1877, Duke of York Island.
- Gnoma cruciata*, T, Kirsch, MT. Mus. Dred., Heft ii. p. 158, Mysol.
- Diastocera reticulata*, J. Thomson, Bull. Soc. Ent. Fr. (5) vii. p. cxli., Bagamoyo.
- Hybolasius lanipes*, D. Sharp, Ent. M. M. xiii. p. 195, New Zealand.
- Eczemotes guttulata*, Bates, *l. c.* p. 158, pl. xxv. fig. 4, Duke of York Island.
- Praonetha consobrina*, H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. lxxvii., from a larva only, in fruit of *Elaeococca vernicosa*, from Cochin China.
- Rhopaloscelis maculatus*, H. W. Bates, Ent. M. M. xiv. p. 38, Japan.
- Phytecia peregrina*, p. cxxxv., Algiers, *nazarena* and *sanctu*, p. cxxxvi., Nazareth, *annulicornis*, Algeria, *vittipennis*, Balkans, p. cxli., Reiche, *l. c.*; *P. tenuilinea*, L. Fairmaire, Pet. Nouv. ii. p. 98, Algeria; *P. caroni*, E. Mulsant & A. Godart, Ann. Soc. L. Lyon (n.s.), xxii. [for 1875, published in 1876] p. 419, Tours [see Zool. Rec. xiii. *Ins.* p. 106].
- Oberea bicolor*, Portugal, *melitana*, Malta, Reiche, *l. c.* p. cxlix.

CHRYSMELIDÆ.

- BURMEISTER, H. *Phytophaga Argentina*. S. E. Z. xxxviii. pp. 52-67.
- Enumerates 65 species of *Sagrides*, *Donaciides*, *Criocerides*, *Megalopides*, *Clithrides*, and *Cryptocephalides*, including some new, from the La Plata Region.
- Sagrides*.
- Orsodacna variabilis*, sp. n., J. S. Baly, Ann. N. H. (4) xx. p. 377, Kurdistan.
- Aulacoscelis melanocephalus*, sp. n., M. Jacoby, P. Z. S. 1877, p. 510, Guatemala.
- Oriocerides*.
- Syneta adamsi*, sp. n., Baly, *l. c.* p. 378, Manchuria, Japan.
- Lema proxima* and *liliacea*, p. 54, *planicollis* and *porcata*, p. 56, spp. nn., Burmeister, *l. c.*, Paraguay.
- Criocerus balyi*, sp. n., E. v. Harold, MT. Münch. ent. Ver. i. p. 100, Nyassa.
- Megascelidides*.
- Megascelis purpureicollis*, sp. n., Jacoby, *l. c.* p. 511, Nicaragua.

Clithrides.

E. LEFÈVRE, R. Z. (3) v. pp. 223-232, describes the species found by Raffray in Abyssinia and at Zanzibar. Several varieties of known species are recorded.

Camptolenes raffrayi and *abyssinica*, spp. nn., *id. l. c.* p. 223, Abyssinia.

Peploptera abyssinica, sp. n., *id. l. c.* p. 225, Aduah.

Gynandrophthalma punctipennis, p. 226, *vittata* and *viridimaculata*, p. 227, *bifasciata*, p. 229, *jucunda*, *fastidiosa*, and *postica*, p. 230, *miochiroides*, p. 231, and *incerta*, p. 232, Abyssinia, *zanzibarica*, p. 229, *circumdata*, p. 231, Zanzibar, *id. l. c.*, spp. nn.

Dinophthalma fasciata and *nigriceps*, p. 179, *consimilis*, p. 180, spp. nn., J. S. Baly, Cist. Ent. ii., Amazon district.

Proctophana amazona, sp. n., *id. l. c.* p. 180, Amazon district.

Themisia grandis, sp. n., *id. l. c.* p. 181, Brazil.

Megalostomis generosa, p. 181, *interrupto-fasciata*, p. 182, *cærulea*, p. 183, spp. nn., *id. l. c.*, Amazon district.

Coscinoptera argentina, sp. n., H. Burmeister, S. E. Z. xxxviii. p. 60, Enteros.

Dachrys bipartita, sp. n., Jacoby, *l. c.* p. 511, Nicaragua.

Cryptocephalides.

J. S. Baly, Tr. E. Soc. 1877, p. 23, restores and redescribes as genera many of Suffrian's groups of *Cryptocephalus* previously characterized as distinct by Stål, Saunders, and others; and divides Chapuis's sub-family *Cryptocephalites*, with such of his *Monachites* as have a well-developed scutellum, into two primary groups; the first including *Cryptocephalus* proper, *Monachus*, and allied Old-world forms, with elongate and broadly emarginate eyes, and the second with shorter and more deeply and narrowly notched eyes, including Australian forms, of which he describes several as new.

Cryptocephalus phaleratus, *undatus*, *undulatus*, and *fulgurans*. Observations on confusion by Suffrian, &c.; G. Tappes, Bull. Soc. Ent. Fr. (5) vii. p. lviii.

New genera and species :—

Cyphodera, Baly, *l. c.* p. 25. Differs from *Cadmus* in the extreme gibbosity of its thoracic dorsum. Type, *Cadmus chlamydidiformis*, Germ.

Chariderma, *id. l. c.* p. 28. Allied to *Idiocephala*, but with intermediate joints of antennæ dilated in the female. *C. pulchella* [-lum], p. 29, W. Australia.

Stegnocephala, *id. l. c.* p. 32. Differs from *Monachus* in the produced anterior border of the prosternum, larger size, larger eyes, and longer antennæ. For *Cryptocephalus hemixanthus*, Suffr., and allies; also *S. discoidalis*, p. 222, Amazon River.

Nyetra, *id. l. c.* p. 33. Suggests the males of some of the *Clithrids*, being remarkable for the prolongation of the parts of the mouth and lower part of the face in that sex. Allied to *Scaphodius* and *Elaphodes*. *N. forcipata*, p. 34, New Caledonia.

Paracephala, id. l. c. p. 222. Differs from *Ochrosopsis* in the deep groove separating the prosternum from the anterior episternum. For *Cryptocephalus filum*, Chap., and *P. pectoralis*, p. 223, Cape York.

Euphyma, id. l. c. p. 224. Separated from *Paracephala* by the obtusely truncate hinder apex of the prosternum. For *Cryptocephalus flaviventris* and *elegans*, Saund.

Paracadmus, id. l. c. p. 227. Separated from *Cadmus* and allies by the strongly bilobate hinder apex of the prosternum, and from *Ochrosopsis* and *Idiocephala* by the crenulated margin of the thorax. *P. lucifugus*, p. 228, Australia.

Tappesia, id. Ann. N. H. (4) xx. p. 378. Allied to *Elaphodes* and *Ochrosopsis*. *T. saundersi*, p. 379, S. Australia.

Stylosomus depilis, Corsica, *rugithorax*, Hautes and Basses Alpes, A. de Perrin, Bull. Soc. Ent. Fr. (5) vii. p. xlix.

Metallactus eximius, Baly, Tr. E. Soc. 1877, p. 230, Pará, Santarem.

Acolastus simonsi, id. l. c. p. 229, Lake Nyassa.

Griburius octo-guttatus, p. 65, Parana, *persimilis*, p. 66, Buenos Aires, H. Burmeister, S. E. Z. xxxviii.

Pachybrachys denitzi, E. v. Harold, Deutsche E. Z. 1877, p. 361, Japan ; *P. contortus*, Baly, l. c. p. 231, Pará, Santarem.

Monachus anthracinus, p. 62, *ebeninus*, p. 63, and *flavifrons*, p. 64, Patagonia, *saucius*, p. 63, La Plata, Burmeister, l. c. ; *M. angulicollis*, Colombia, *obscuricollis*, Pará, Baly, l. c. p. 215.

Melixanthus pudibundus, p. 338, and *adumbratus*, p. 339, Abyssinia, *raffrayi*, p. 340, Zanzibar, Chapuis, Ann. Mus. Genov. ix. ; *M. adamsi*, p. 216, Canton River, *placidus*, p. 217, China, Baly, l. c.

Dioryctus mouhoti, Baly, l. c. p. 36, Siam.

Cenobius lucidulus, p. 340, Cape York, *biseriatus*, p. 341, Abyssinia, Chapuis, l. c. ; *C. lividipennis*, p. 211, Guinea, *ruficollis* and *discoidalis*, p. 212, Natal, *fulvipes*, p. 213, India, *chinensis*, p. 214, China, Baly, l. c.

Prasonotus ruficaudis and *morbillosus*, Baly, l. c. p. 35, New South Wales and W. Australia.

Ditropidus imperialis, p. 335, *doria*, p. 336, *albertisi*, p. 337, Chapuis, l. c., Cape York ; *D. wallacii*, p. 379, Mysol, *jacobii*, S. Australia, and *laevigatus*, N. Australia, p. 380, *pascoii*, Melbourne, and *elegantulus*, Australia, p. 381, *pictus*, W. Australia, and *antennarius*, Moreton Bay, p. 382, *amabilis*, Cape York, and *submetallescens*, Gawler, p. 383, *cornutus*, p. 384, Australia, *subcylindricus*, p. 385, W. Australia, Baly, Ann. N. H. (4) xx.

Polyachus bicolor, Baly, l. c. p. 386, Gawler, S. Australia.

Cryptocephalus jansoni, p. 218, Shantung, *notatipennis*, p. 219, *gratus*, p. 220, *histrionicus* and *amazonus*, p. 221, Brazil, id. Tr. E. Soc. 1877 ; *C. iridipennis*, p. 344, Australia, *trigeminus*, p. 346, *contrarius*, p. 347, *septem-plagiatus* and *ellipticus*, p. 348, Abyssinia, *araticollis*, p. 349, Zanzibar, Chapuis, l. c. ; *C. carbonarius*, Burmeister, l. c. p. 64, Buenos Aires.

Rhombosternus pretiosus, Baly, l. c. p. 226, Australia.

Cadmus cariosus, p. 342, *lutatus*, p. 343, New South Wales, Chapuis, l. c.

Idiocephala chapuisi, p. 224, Rockhampton, *bella*, p. 225, Cape York, Baly, l. c.

Ochrosopsis erudita, id. l. c. p. 30, S. Australia.

Eumolpides.

E. LEFÈVRE, Ann. Soc. Ent. Fr. (5) vii. pp. 114-166, 309-326, describes new or little known species, including six new genera.

Metaxyonycha crucifera does not occur in N. America; *M. chevrolati*, Dej. Cat., = *chlorospilota*, Marshall, which alone occurs in Mexico.

New genera and species :—

Choris, id. l. c. p. 123. Iphiméites; with entire eyes, prosternum almost elongate lozenge-shaped, transverse thorax, &c. *C. nucea*, *flavida*, and *lateralis*, p. 124, Colombia.

Hermesia, id. tom. cit. Bull. p. clxxviii. Near *Colaspis*, but with larger eyes, different thorax and prosternum. For *C. aurata*, Ol., and *H. purpurea* and *fulgidicollis*, p. clxxix., Brazil.

Promecosoma (Chevr., in Dej. Cat., ined.), id. tom. cit. Ann. p. 126. Differs from *Metaxyonycha* in structure of antennæ, facies, and coloration. *P. abdominale* (Dej. Cat.) and *dispar*, p. 127, *scutellare* and *nobilitalum*, p. 128, *cinctipenne*, p. 129, *elegantulum* and *sallæi*, p. 130, *sanguinolentum*, *dugesi*, and *jucundum*, p. 131, *inflatum*, p. 132, *dilatatum* and *chrysis*, p. 133, *fervidum* and *lepidum*, p. 134, *lugens*, p. 135, Mexico.

Adorea, id. l. c. p. 135. Near *Colaspis*, differing in the form of prosternum and structure of antennæ. *A. speciosa*, p. 136, Quito.

Podoxenus, id. l. c. p. 148. *Colaspites*: with large eyes, joints three and four of antennæ short, basal joint of hind tarsi very long, &c. *P. chapuisi* and *limbatus*, p. 149, *cæruleatus* and *troglydites*, p. 150, *rufimanus*, *cicatricosus*, and *luridus*, p. 151, *cozalis*, p. 152, Brazil.

Hypoderes, id. l. c. p. 153. *Colaspites*: entirely squamose. *H. denticollis*, p. 154, Moreton Bay, Australia.

Otilea, id. l. c. p. 154. With the laterally dentate thorax of the *Colaspites*, and prosternum as in the *Chalcophanites*. For *Colaspis cariosa*, Ol., and *Galeruca crenata*, F.

Sybraicus, E. v. Harold, MT. Münch. ent. Ver. i. p. 106. *Nodostomina* (no differential characters given). For *N. magnificum*, Baly, and *S. lefevrii*, ibid., Madagascar.

Rhembastus, id. l. c. p. 101. *Typophorinæ* (no differential characters given). For *Rhyparida collaris*, Gerst., *micans*, Gerst., = *trivialis*, Gerst., *cyanipennis* and *obscura*, Gerst.; also *Rhemb. puncticollis*, p. 102, and *variabilis*, p. 103, Nyassa, *geniculatus*, *striatus*, and *suturalis*, p. 102, *nanulus*, *pusillus*, and *nubilus*, p. 103, Madagascar.

Ivongius, id. l. c. p. 104. Differs from *Rhembastus* in its simple femora and clypeus being marked off by a distinct furrow. *I. rufipes*, *rufinus*, and *antennarius*, ibid., Madagascar.

Pheloticus, id. ibid. Nearest *Typophorus*, but with less rounded prothoracic episternum, antennæ scarcely thickened towards the apex, tibiae neither keeled nor channelled, and shorter inner claw-spine. *P. dorsalis*, p. 105, Madagascar.

Nossiacus, id. *l. c.* p. 105. Differs from the other *Typophorine* chiefly in its divaricate claws, and from *Aulacia* in its dentate posterior femora. *N. lefevrii*, *ibid.*, E. Madagascar.

Spintherophyta cephalotes, Lefèvre, *Ann. Soc. Ent. Fr.* (5) vii. p. 115, Mexico.

Chrysodina fuscitarsis and *ignita*, p. 116, *festiva* and *corrusca*, p. 117, Mexico, *frontalis*, p. 117, Brazil, *cupriceps*, Honduras, and *opulenta*, Uruguay, p. 118, *id. l. c.*

Lamprospheer *cæruleatus*, id. *l. c.* p. 119, Amazon River and Peru.

Phædra dives, id. *l. c.* p. 119, Mexico.

Agrianes viridi-cæneus, id. *l. c.* p. 120, Uruguay.

Iphimeis erythropus and *cribrata*, id. *l. c.* p. 121, Brazil.

Lepronota tuberculata and *pubescens*, id. *l. c.* p. 122, Brazil.

Metaxyonycha costata, p. 125, *viridilimbata*, p. 126, *id. l. c.*, Brazil; *M. tridentata*, M. Jacoby, P. Z. S. 1877, p. 512, Nicaragua.

Colaspis eumolpoides, p. 136, *procerula*, p. 141, *pulchella*, p. 143, Peru, *heros*, p. 137, Ecuador, *fulvicollis*, p. 137, *viridissima* and *lacordairii*, p. 138, *pallipes*, *viridipes*, and *cupreo-vittata*, p. 140, *interstitialis*, p. 141, *duplicata* and *violacea*, p. 142, *cupripennis*, p. 143, *sulcata* and *14-costata*, p. 144, *ustulata*, p. 145, *derosa* and *fulvimana*, p. 146, *nigrimana*, p. 147, Brazil, *cruentata*, p. 138, *notaticornis*, p. 147, Venezuela, *impressa*, p. 139, Guatemala, *abdominalis* and *sulphuripes*, p. 139, *costipennis*, p. 142, Argentine States, *compta*, p. 144, *auricollis*, p. 147, Colombia, *insidiosa*, p. 145, Antilles, Lefèvre, *l. c.*; *C. lefevrii*, Baly, Tr. E. Soc. 1877, p. 37, River Amazon.

Stenolompra kirschi, Lefèvre, *l. c.* p. 152, Pozuzu.

Dermorrhitis cærulea, Jacoby, *l. c.* p. 514, Borneo.

Corysthea nigripennis, Lefèvre, *l. c.* p. 156, Amazon River.

Eriphyle nigrirarsis, Brazil, *balyi*, Cayenne, *id. l. c.* p. 157.

Nodostoma davidi, p. 157, *chinense* and *oberthueri*, p. 158, *id. l. c.*, Kiang-Si; *N. magnificum*, Madagascar, and *tricolor* with var. *pachybouri*, Siam, p. 38, *dormeri*, p. 39, India, *bevani*, p. 40, South India, Baly, *l. c.*; *N. balyi*, Harold, Deutsche E. Z. 1877, p. 361, Japan.

Scelodonta vicina, Harold, MT. Münch. ent. Ver. i. p. 106, Nyassa; *S. albido-vittata*, p. 42, Damara Land, *bidentata*, p. 43, Old Calabar, Baly, *l. c.*; *S. viridimaculata*, Jacoby, *l. c.* p. 514, Cameroons; *S. raffrayi*, p. 160, *impressipennis*, p. 162, Abyssinia, *egregia*, p. 161, Old Calabar, *cyanea*, p. 161, Cape of Good Hope, *strigata*, p. 162, Zanzibar, *bicolor*, p. 164, Illinois, Lefèvre, *l. c.*

Fidia pedestris, p. 164, *spuria*, *humeralis*, and *plagiata*, p. 165, *albo-vittata* and *sallwei*, p. 166, Lefèvre, *l. c.*, Mexico.

Heteraspis annamita, id. *l. c.* p. 309, Cochin China and Hong Kong.

Pseudocolaspis rigida, p. 43, Cameroons, *eximia*, p. 44, West Coast of Africa, Baly, *l. c.*; *P. oberthueri*, L. Fairmaire, Pet. Nouv. ii. p. 98, Menah.

Rhyparida (wrongly merged by Chapuis in *Metachroma*) *formosa*, p. 40, New Hebrides, *howiti*, p. 41, Australia, Baly, *l. c.*; *R. madagascariensis*, p. 512, *costatipennis* and *nigricollis*, p. 513, Jacoby, *l. c.* Madagascar.

Eumolpus (monographed, p. 45 et seq.) *separatus*, p. 47, La Plata, Uruguay, Brazil, *nitidus*, p. 48, Amazon, Cayenne, *australis*, p. 50, Cordova, Peru, *imperialis*, p. 51, Cayenne, Martinique, *speciosus*, p. 52, Cayenne, *batesi*, p. 53, and *carinatus*, p. 54, Amazon, Baly, l. c.

Colasposoma inconstans (renamed *instabile*, op. cit. SB. p. xviii.) and *costatum*, p. 105, Nyassa, *flavipes*, Natal, and *madagassum*, Madagascar, p. 106, Harold, MT. Münch. ent. Ver. i.; *C. pradieri*, p. 310, *fairmairii*, p. 311, Old Calabar, *dejeani*, p. 311, *femorale*, p. 314, Senegal, *bonvouloiri*, *thoracicum*, and *amplicolle*, p. 312, *fulvipes*, *chloris*, *pubescens*, and *fulgidum*, p. 313, *scutellare*, *jucundum*, and *separatum*, p. 314, S. Africa, *abdominale*, p. 315, Zanzibar, Lefèvre, l. c.

Typophorus nobilis, p. 316, *versutus*, p. 317, *rufipes*, *picimanus*, and *umbratus*, p. 318, *nigro-notatus*, *tibialis*, and *nanus*, p. 319, Brazil, *chalcus* and *sturmi*, p. 317, Mexico, *annulatus*, p. 318, Colombia, *histrio*, p. 319, North America, Lefèvre, l. c.

Syagrus morio, Harold, l. c. p. 101, Natal; *S. puncticollis*, p. 320, Zanzibar, *dilutus*, p. 320, *geniculatus*, p. 321, *tibialis*, *mniszewski*, *goudoti*, and *madagascariensis*, p. 322, *tantillus*, p. 323, Madagascar, *bimaculatus*, p. 320, *striatipennis* and *nigro-signatus*, p. 321, Gaboon, *quadrinotatus*, p. 321, *natalensis*, p. 322, *maculatus*, p. 323, Natal, *atomarius*, p. 323, S. Africa, Lefèvre, l. c.

Eurydemus hartmanni and *nubiensis*, p. 100, Sennaar, *flavicans* and *maculosus*, Nyassa, and *madagassus*, Madagascar, p. 101, Harold, l. c.

Corynodes raffrayi, Lefèvre, l. c. p. 324, Zanzibar.

Chrysochus mniszewski, id. *ibid.*, p. N. America.

Colaspoides ocellata, id. l. c. p. 325, Brazil.

Dermoxanthus spinipes, id. l. c. p. 326, Zanzibar.

Chrysomelides.

Thirty-seven species, some new, from Colombia described by E. Steinhil, MT. Münch. ent. Ver. i. pp. 31-48, pl. i. *Doryphora rugosa*, Jacoby, fig. 1; *D. geminipuncta*, Stål, var. ?, fig. 3. [It is impossible to make this entry without praise for the remarkable excellence of the plate mentioned.]

Chrysomela violacea, ♀, and *C. staphylea*, ♂, in copulâ, no eggs resulting; Frölich, Ent. Nachr. iv. p. 29.

Chrysomela lucida, ♀, and *Lina populi*, ♂, in copulâ at Pau (many instances); De Contes, Pet. Nouv. ii. p. 141.

Polygramma and *Leptinotarsa*. On their value as generic groups, and on the synonymy of the species of the former; A. Chevrolat, Bull. Soc. Ent. Fr. (5) vii. p. cxlii. et seq.

Doryphora 10-lineata. On its possible introduction into England; J. W. Douglas, Ent. M. M. xiii. p. 182. Epitome of its recent progress in N. America; C. V. Riley, Rep. Ins. Mo. ix. pp. 34-47. Provancher, Nat. Canad. ix. p. 235, notes newspaper reports of the beetle having reached Montreal in June, 1877, and Quebec in July. He apparently doubts the correctness of this statement and suggests confusion with allied species. He records it himself in August (p. 251) 24 miles behind Quebec. On its being recorded from Mülheim; M.

Girard, Bull. Soc. Ent. Fr. (5) vii. pp. cxix.-cxxii.; cf. also Ent. Nachr. iii. pp. 147, 160, 162, 183. A. R. Grote & A. Kayser, in P. Am. Ass. xxiv. (Detroit : 1875), 1876, p. 226, describe experiments with liquid and tincture of the potato-beetle, tending to disprove any poisonous quality by the insect. A pamphlet by C. Stål, "Om Colorado-Skalbaggen," &c., Stockholm : 1875, 8vo, pp. 21, fig., has not been seen by the Recorder (full title in Pysche ii. p. 96).

Paropsis. 226 species (nearly half of them new) tabulated in four groups, according to the sculpture of the elytra. F. Chapuis, Ann. Ent. Belg. xx. pp. 67-100.

New genus and species :—

Euryceræa, Steinheil, l. c. p. 33. Next *Doryphora* : of metallic colour, and with the three apical joints of antennæ forming a wide flat club. *E. badeni*, ibid. pl. i. fig. 5, W. Colombia, and *wagneri*, p. 35, Ecuador.

Melasoma japonica [-cum], E. v. Harold, Deutsche E. Z. 1877, p. 362, Hagi, Japan.

Chrysomela (*Tenistiola*, Mots.) *instabilis*, F. W. Mäklin, Öfv. Fin. Soc. xix. p. 30, Siberia ; *C. acuticollis*, L. Fairmaire, Bull. Soc. Ent. Fr. (5) vii. p. clxxix., Gap, Hautes Alpes.

Calligrapha distinguenda, p. 518, Nicaragua, and *elegantula*, p. 519, Costa Rica, M. Jacoby, P. Z. S. 1877.

Leptinotarsa behrensi, Harold, MT. Münch. ent. Ver. i. p. 16, California.

Deuteroctampa fasciata, Steinheil, l. c. p. 35, Colombia.

Labidomera (*Cryptostetha*) *ocanana*, id. l. c. p. 36, Ocaña.

Doryphora bicolor, p. 515, *ornata* and *D. (?) antennalis*, p. 516, *bisbi-maculata*, p. 518, Nicaragua, *sexmaculata* and *chrysomeloides*, p. 517, Peru, Jacoby, l. c. ; *D. bilunata*, p. 183, Upper Amazons, *jansoni*, p. 184, Brazil, J. S. Baly, Cist. Ent. ii. ; *D. haroldi*, *pulchella*, *bivittaticollis*, and *ingenua* (diagnoses only), id. Ent. M. M. xiii. p. 273, Colombia ; *D. hemisphærica*, p. 39, *brevispina*, p. 40, fig. 7, *landolti*, p. 41, fig. 2, *luteipennis*, p. 42, *arangoi*, p. 43, fig. 6, *stali*, p. 44, fig. 8, *wallisi*, p. 45, fig. 4, *radiata*, p. 46, fig. 9, Steinheil, l. c. pl. i., Colombia.

Microtheca columbiana, Steinheil, l. c. p. 47, Bogota.

Paropsis aciculata, *nigro-scutata*, *pictipes*, *rufitarsis*, p. 68, *irrotata*, *formosa*, p. 69, *stali*, *bipuncticollis*, *umbrata*, *contracta*, p. 70, *abdominalis*, *pedestris*, *globata*, *rubecola*, *hemisphærica*, *globulosa*, p. 71, *semipunctata*, *hastata*, *subovalis*, *oblonga*, *araria*, p. 72, *foraminosa*, *perplexa*, *tenebrosa*, *stygia*, p. 73, *iris*, *mera*, *picta*, *complexa*, p. 74, *agricola*, *flavitaris*, *ornaticollis*, *conjugata*, *subcostata*, p. 75, *trimaculata*, *gemina*, *nigro-vittata*, *basalis*, *variabilis*, *trivittata*, p. 76, *pluvialis*, *nigro-stillata*, *umbrosa*, *notatipennis*, p. 77, *anzia*, *orphanula* (= *orphana*, Er., ex. typ., p. 100), *delicatula*, *obovata*, *vulgaris*, p. 78, *hectica* (Boisd.), *citrina*, *equalis*, *deflorata*, *elliptica*, p. 79, *pachyta*, *flaveola*, *albicans*, *interstitialis*, *proxima*, *debilis*, p. 80, *lucidula*, *fastidiosa*, *cernua*, *conferta*, *decolorata*, p. 81, *variicornis*, *irina*, *nigrita*, *aneipennis*, *discoidalis*, *partita*, p. 82, *festivus*, *rufescens*, *tenella*, *mitis*, *virens*, *modesta*, p. 83, *viridula*, *subnlescens*, *cemula*, *substriata*, *interrupta*, *jucunda*, *venustula*, p. 84, *amabilis*, *fusci-*

tarsis, *amœnula*, *stillatipennis*, *subfasciata*, *fuscula*, p. 85, *defecta*, *subapicalis*, *coadnuta*, *fraterna*, *scutellata*, p. 86, *turbata*, *scaphula*, *navicula*, *depressa*, p. 87, *basicolis*, *spectabilis*, *rubiginosa*, p. 88, *suturella*, *tetra-spilota*, *picturata*, *dimidiata*, *pulchella*, *pallidula*, p. 89, *livida*, *tigrina*, *multiseriata*, *obscura*, *arcula*, *orbicularis*, p. 90, *diffusa*, *scabra*, *impressa*, *rugosa*, *aspera*, p. 91, *ferrugata*, *caliginosa*, *piceola*, *melanospila*, *coriacea*, p. 92, *convexicollis*, *litigiosa*, *exarata*, *catenata*, *infuscata*, p. 93, *fusconotata*, *explanata*, *sublimbata*, *tuberculata*, *spilota*, p. 94, *cancellata*, *asperula*, *verrucicollis*, *granaria*, p. 95, *nodosa*, *scalaris*, *graphica*, *costipennis*, *corrugata*, p. 96, *strigosa*, *semiglobosa*, *rufo-nigra*, *pardalis*, p. 97, Chapuis, l. c., various Australasian localities.

Halticidæ.

Species taken by Abendroth in the Pozuzu Valley, described with other Peruvian species; E. v. Harold, Deutsche E. Z. 1877, pp. 129-152.

Graptodera plicipennis, Mann., = *Haltica bimarginata*, Say; E. P. Austin, Canad. Ent. ix. p. 94.

Aspicela. The known (and some new) species described. *A. bourcieri*, Guér., = *scutata*, Latr., var.; E. v. Harold, MT. Münch. ent. Ver. i. pp. 17-21. *Xenaltica picea*, Baly, = *Myrcina olivacea*, Klug; p. 109.

Argopus. Analytical table, with observations on specific characters; L. W. Schaufuss, Nunq. Ot. ii. pp. 423 & 424.

New genera and species:—

Jobia, T. Kirsch, MT. Mus. Dresd., Heft ii. p. 159. *Oxygonites*; differing from *Chalenus*, Westw., in the mucronated hinder tibiae, from *Sophrena* in the longer antennæ, and from the other genera of the group in facies, the build of thorax, which has no dentate projecting angles, and the short triangular, laterally rounded, scutellum. *J. atra*, ibid., Jobi, New Guinea.

Eriotica, E. v. Harold, MT. Münch. ent. Ver. i. p. 107. *Halticina sulcicolles*, near *Diphaulaca*, but with pilose elytra and narrow pronotum. *E. fuscipennis*, ibid., Nyassa.

Nephrica, id. Deutsche E. Z. 1877, p. 132. *Sulcicolles*: thorax with no distinct transverse furrow at base, but with linear impression at posterior angles: near *Disonychia*, with reniform eyes and margined thorax. *N. kirschi*, p. 133, Peru; also *Haltica didyma*, Ill.

Scallodera, id. l. c. p. 365. *Sulcicolles*, near *Lactica*. For *Graptodera fulvipennis*, Baly.

Clitea, J. S. Baly, Tr. E. Soc. 1877, p. 287. Nearly allied to *Mantura*, but with short broad head and no perpendicular grooves at base of thorax. *C. picta*, ibid., India.

Apræa, id. l. c. p. 293. Differs from *Aphthona* in the four front tibiae being spineless at apex, and in the distinctly lobed basal margin of thorax. *A. jansoni*, p. 294, Jamaica.

Leptophysa, id. l. c. p. 165. [No differential characters given or position indicated.] Placed between *Sebæthe* and *Chactocnema*. *L. batesi*, p. 166, Pará.

Stenophyma, id. l. c. p. 176. [Same note.] Between *Chetocnema* and *Longitarsus*. For *S. elegans*, ibid., Brazil.

Stegnaspæa, id. l. c. p. 181. No scutellum; in other respects closely agreeing with *Apteropoda* and allies. *S. trimeni*, p. 182, Cape of Good Hope.

Homophyla, Harold, Deutsche E. Z. 1877, p. 138. *Acanthopodes*: before *Aspicela*; form of *Sphæroderma*, but with the hinder tibiæ emarginate externally. *H. adusta*, p. 139, Peru.

Hyphasis, id. l. c. p. 434. Near *Edionychis*, differing in the antennæ, the longer basal joint of posterior tarsi, and the sub-dilate flat prosternum. *H. magica*, p. 433, Darjeeling.

Apocrypta pallida, Sumatra, *purpurea* and *coccinelloides*, Borneo, Baly, Ent. M. M. xiii. p. 224.

Nisotra breweri, id. Tr. E. Soc. 1877, p. 157, Rockhampton.

Arsipoda hæmatodera, p. 158, and *cæruleata*, p. 159, W. Australia, *fulvipes*, p. 284, Rockhampton, *mærens* and *wallacii*, p. 285, New Guinea, id. l. c.

Sophræna peruviana, Harold, l. c. p. 137, Peru.

Chetocnema natalensis, p. 166, Natal, *wollastoni*, Cape of Good Hope, and *persica*, Persia, p. 167, *cognata*, p. 168, *squarrosa*, p. 169, *bretinghami* and *concinripennis*, p. 170, India, *wallacii*, Malacca, and *robusta*, Brazil, p. 171, *clypeata*, p. 172, Pará, *mexicana*, p. 173, Teapa, *megalopoides*, ibid., *fusco-maculata* and *carinata*, p. 174, and *submetallescens*, p. 175, Australia, *erichsoni*, p. 175, Tasmania, *divergens*, p. 301, Campeche, *gravidæ* and *sallæi*, p. 302, Mexico, *pallidicornis*, p. 303, Jamaica, *steinheili* and *separata*, p. 304, *labiata*, p. 305, and *haroldi*, p. 306, Colombia, *amazona*, p. 306, Santarem, *braziliensis*, p. 307, Brazil, *blanchardi* (*ænea*, Blanch., nec Waterh.), p. 308, Chili, *rugiceps*, p. 308, and *madagascarensis*, p. 309, Madagascar, *parvula*, Ceylon, and *basalis*, India, p. 310, *westwoodi*, p. 311, and *nitens*, p. 312, Batchian, *malayana*, p. 312, Malay Archipelago, *wilsoni*, p. 313, *propinqua*, p. 314, *waterhousii* and *laticeps*, p. 315, *laticollis*, p. 316, *brevicornis*, p. 317, Australia, Baly, l. c.

Xenidea wallacii and *purpureipennis*, id. l. c. p. 318, New Guinea.

Euplectroscelis (Crotch; *Homophyla*, Har.) *deyrollii* and *tibialis*, p. 319, *bimaculata* and *placida*, p. 320, Brazil, *nigripennis* and *sordida*, p. 321, R. Amazon, id. l. c.

Pseudodera orientalis, id. l. c. p. 286, Bengal.

Crepidodera africana, p. 159, Guinea, *japonica*, p. 160, Hakodadi, *costipennis*, Borneo, and *collaris*, Shanghai, p. 161, *parallela*, Sydney, and *vestita*, Gawler, p. 162, id. l. c.; *C. picticornis* and *madagassa*, p. 107, *varicornis*, *analis*, and *goudoti*, p. 108, Harold, MT. Münch. ent. Ver. i., Madagascar; *C. peruviana*, id. Deutsche E. Z. 1877, p. 130, Peru.

Epitrix inæqualis, Harold, Deutsche E. Z. 1877, p. 130, Peru.

Systema ornata, Jamaica, and *deyrollii*, Brazil, p. 288, *cæruleata*, p. 289, R. Amazon, Baly, l. c.

Haltica amazona, id. l. c. p. 163, Pará, Santarem; *H. foveigera*, Harold, MT. Münch. ent. Ver. i. p. 107, Nyassa; *H. convexa*, id. Deutsche E. Z. 1877, p. 131, Peru.

Phygasia limbata, Baly, l. c. p. 290, Lake N'gami. .

Docema collaris, id. l. c. p. 293, W. Australia.

Thyamis breviscula, E. Mulsant & C. Rey. Ann. Soc. Linn. Lyon (n.s.), xxii. [for 1875, published in 1876], p. 253, Collioure; *T. (as Longitarsus) janulus*, T. V. Wollaston, Col. St. Hel. p. 213, St. Helena; *T. (L.) amazonus*, Pará, *scutellatus*, Rockhampton, p. 177, *concinus*, p. 290, Mexico, *buckleyi*, Ecuador, and *fryellus*, Brazil, p. 291, *wallacii*, Celebes, and *capensis*, Cape of Good Hope.

Aphthona wallacii, p. 178, Flores, *chinensis*, China, and *crassicornis*, Jamaica, p. 295, *pilatii* and *deyrollii*, p. 296, *diversa*, p. 297, Mexico, *verticalis*, p. 297, and *nigro-cyanea*, p. 298, New Friburg, *fulripes*, p. 298, and *amazona*, p. 299, Pará, Baly, l. c.

Phyllotreta orientalis, p. 178, Kurdistan, *cumingi*, p. 179, Manila, *jamaicensis* [sic], p. 299, Jamaica, *malayana*, Celebes, and *downesi*, Bombay, p. 300, Baly, l. c.; *P. birmanica*, Harold, MT. Münch. ent. Ver. i. p. 109, Burma.

Aspicela flavicans, p. 19, Fusagusaga, *marmorata*, p. 20, Ocaña, Harold, l. c.

Asphæra deleta, Bahia, *corusca*, Montevideo, id. l. c. p. 108; *A. granulosa*, p. 140, *abendrothi*, p. 141, *meticulosa*, p. 142, *mylabroides*, p. 143, *magistralis*, p. 144, *chapuisi*, p. 145, *neglecta* and *limitata*, p. 146, *pauperata*, p. 147, id. Deutsche E. Z. 1877, Peru.

Sebiothe nigricornis, Cambodia, and *fulvipennis*, Burma, p. 164, *torrida*, p. 165, Sierra Leone, Baly, l. c.

Edionychis variolosa, p. 21, note, Ecuador, *goudoti* and *facialis*, p. 108, Madagascar, Harold, MT. Münch. ent. Ver. i.; *Æ. insepia* and *sordida*, p. 148, *immunda*, p. 149, *Æ. (?) ophthalmica*, p. 150, Peru, *kiesenwetteri*, *generosa*, and *florigera*, p. 433, *coccinelloides*, *lativittis*, and *sanguinipes*, p. 434, Brazil, *formosa*, p. 433, and *lineola*, p. 434, Montevideo, *fairmairii*, p. 433, Chili, *longula*, California, *dejeani*, Buenos Aires, and *rustica*, Bahia, p. 434, id. Deutsche E. Z. 1877.

Lactica brachydera, p. 134, *kirschi*, p. 135, Harold, Deutsche E. Z. 1877, Peru.

Myrcina acutangula, Nyassa, *balyi*, Madagascar, id. MT. Münch. ent. Ver. i. p. 109.

Diphaulaca sulcifrons, p. 135, *peruviana*, p. 136, id. Deutsche E. Z. 1877, Peru.

Argopus fortunii, Baly, l. c. p. 181, N. China.

Sphaeroderma ornata [-tum], Cambodia, *apicipennis* [-ne], Borneo, Baly, l. c. p. 180; *S. placida* [-dum], Harold, Deutsche E. Z. 1877, p. 364, Hakodadi.

Dibolia duboulayi, Baly, l. c. p. 182, W. Australia.

Megistops ornatus, Santarem, and *pretiosus*, Venezuela, id. l. c. p. 322.

Psylloides chapuisi, Baly, l. c. p. 183, Tringane; *P. splendida*, Harold, Deutsche E. Z. 1877, p. 364, note, Luzon, Philippines.

Haltica (Orestia) paveli, J. Frivaldszky, Term. füzetek, 1877, p. 229, Mehadia, S. Hungary.

Galerucides.

Ænidea, Baly, referred to the *Lyperina*; *Calomicrus flaviventris*, Mots., is a *Malacosoma*; E. v. Harold, Deutsche E. Z. 1877, p. 366.

Triaplatys, g. n., L. Fairmaire, Pet. Nouv. ii. p. 186. Near *Phyllobrotica*, but with fissile claws, last joint of maxillary palpi conical, &c. *T. quadripartita*, sp. n., *ibid.*, New Britain.

Asbecesta, g. n., E. v. Harold, MT. Münch. ent. Ver. i. p. 110. *Ornithognathina*: near *Ornithognathus*, differing in the sulcate thorax, elongate basal joint of tarsi, and small apical joint of palpi. *A. cyanipennis*, sp. n., *ibid.*, Nyassa.

Xenoda, g. n., J. S. Baly, Ent. M. M. xiii. p. 225. Near *Ædicerus*; antennæ in ♂ apparently ten-jointed, but with eighth joint short, spined at the base, and concealed in apex of seventh joint. *X. spinicornis*, sp. n., *ibid.*, Sarawak.

Botanoctona, g. n., Fairmaire, l. c. p. 185. Near *Celomera*: no differential characters suggested. *B. pallido-cincta*, sp. n., *ibid.*, New Britain.

Caritheca, g. n., Baly, l. c. p. 226. Near *Haplosomyx*; for *C. 4-pustulata*, sp. n., *ibid.*, Sumatra.

Diabrotica gloriosa, Bogota, *cinctella*, Colombia, and *nummularis*, Mexico, p. 110, *boliviana*, Bolivia, and *instabilis* (with 5 varr.), Colombia, p. 111, spp. nn., Harold, l. c.

Ceratophysa wallacii, sp. n., Baly, l. c. p. 227, Sumatra.

Lyperodes rufus, sp. n., Harold, l. c. p. 109, Nyassa.

Monocesta dimidiata, Peru, *nicaraguensis*, Chontales, spp. nn., M. Jacoby, P. Z. S. 1877, p. 520.

Monolepta dichroa, sp. n., Harold, Deutsche E. Z. 1877, p. 366, Japan.

Hispides.

Odontota walshi, Crotch, = *Hispa collaris*, Say; E. P. Austin, Canad. Ent. ix. p. 93. *Chelymorpha lewisi*, Crotch, = *Himatidium* 17-punctatum, Say (not *cribraria*, F.); *id.* l. c. p. 94.

F. CHAPUIS, Ann. Ent. Belg. xx., describes the following new species from his own collection and the cabinets of Bonvouloir, Chevrolat, Deyrolle, and Reiche:—

Odontota explanata, p. 5, *subangulata*, p. 8, *obliterata* and *steinheili*, p. 9, *tappesi*, p. 12, *asperifrons*, p. 13, *weyersi*, p. 14, *plebeia* and *bilineata*, p. 16, *anchora*, p. 18, *angusta*, p. 19, Colombia (some under the obsolete name of New Grenada); *gregorii*, p. 6, *deyrollei* and *palliatata*, p. 8, *bellula* and *tricolor*, p. 11, *acuticornis*, p. 12, *verticalis*, p. 14, Mexico (the last doubtful); *tycoides*, *transversalis*, and *ampliata*, p. 6, *erythrodera* (Dej.) and *notaticollis*, p. 11, *basilaris*, p. 14, *lacordairii*, p. 16, *atriceps*, p. 17, *velutina*, p. 18, Cayenne; *coarctata*, *trilineata*, *subænea*, *volcemi*, and ? *postica*, p. 7, *octo-striata*, *sauveuri*, and *obscura*, p. 9, *lebasi*, 4-costata, and *bicostata*, p. 10, *stigmula*, p. 11, *notula* and *cordiger*, p. 12, *badeni* and *perplexa*, p. 13, *tenuis* and *marginiventris*, p. 14, *flaveola*, *difficilis*, *externa*, and *lugubris*, p. 15, *insignita*, p. 16, *sternalis* and *lineola*, p. 17, *putzeysi* and *guerini*, p. 19, *elongata*, *cephalotes*, *nigro-virens*, and *deborrii*, Brazil

(Bahia, New Fribourg, &c.); *haroldi*, p. 10, *bisignata*, p. 13, Buenos Aires; *apicipennis*, Ecuador, *normalis*, Antilles, p. 18; *media*, p. 19, Montevideo.

Uroplata (*Pent[ah]ispa*) *cristata*, p. 21, Antilles; *emarginata*, *ibid.*, Colombia; *chevolati*, *ibid.*, *rodriguezi*, *subvirens*, and *candezii*, p. 22, Guatemala; *fastidiosa*, p. 21, *melanura*, p. 22, Mexico; *fairmairii*, p. 22, Costa Rica.

U. (Heter[oh]ispa) *infusata* (Dej.), p. 23, Bahia.

U. (Oethispa [rectius *Ochtherohispa*], subg. n., p. 23) *fossulata*, p. 23, *elongata* and *binotata*, p. 24, *pustulata*, p. 25, Brazil, *humerosa*, Peru, and *centro-maculata*, Mexico, p. 24 (*U. puella*, *robinsoni*, and *miniata*, Baly, are also referred to this new subgenus).

U. (Uroplata proper) *carinifrons*, p. 25, Colombia; *aberrans*, *ibid.*, *sculptilis*, p. 27, *bipuncticollis* and *crassicornis*, p. 28, Mexico; *filiformis*, p. 25, *picta*, *plagipennis*, and *pallipes*, p. 26, *lucida* and *carinata*, p. 27, *depressa*, p. 28, *venusta*, *rubida*, and *terminata*, p. 29, *ambigua*, *planiuscula*, *decipiens*, and *nobilis*, p. 30, *fusca* and *sublimbata*, p. 31, *parvula* and *bilineata*, p. 32, *bonvouloiri*, p. 33, Brazil; *bivitticollis*, p. 26, *jucunda*, p. 28, Buenos Aires; *castanea* and *emilii*, p. 27, *sinuosa*, p. 31, *trivittata*, p. 32, Cayenne; *nigripes*, p. 29, La Plata; *minuscula*, p. 31, Montevideo.

Monochirus fimbriatus, p. 47, Tasmania, *germari*, *Carpentaria*, *coarctatus*, Sydney, p. 48.

Platypria dimidiata, Malacca, *raffrayi*, Zanzibar, and *luctuosa*, Calabar, p. 49, *abdominalis*, p. 50, Madagascar.

Hispa (Thorac[oh]ispa) *dregii*, p. 50, S. Africa, *H. (Hispella)* *incerta*, *ibid.*, W. Africa, *stygia*, p. 51, Hindostan, *H. (Hispa)* *subhirta*, Madagascar, *dama*, Hindostan, *alternata*, Java, *torulosa*, Caffraria, p. 52, *ramulosa*, Caffraria, *gestroi*, Madagascar, *ramuligera*, Malacca, p. 53, *discoidealis*, Celebes, *setifera*, Batchian, *insignita*, Ceylon, p. 54, *trifida*, Malacca, *ritsemæ*, Madagascar, *pubicollis*, Cape of Hope, p. 55, *mamillata*, Cape, *tenuicornis*, Caffraria, *clementis* (no locality), *brevispinosa*, Hindostan, p. 56, *sulcata* (no locality), *laticollis*, W. Africa, p. 57.

Sten[oh]ispa attenuata, sp. n., J. S. Baly, Cist. Ent. ii. p. 185, Panama.

Cassidides.

Thirty-nine species (some new) from Colombia, collected by E. Steinhil, described by B. Wagener, MT. Münch. ent. Ver. i. pp. 49-58. Some varieties are described but not named. *Physonata cyrtodes* = *alutacea*, Boh.

Cassida azurea. On its colour varieties; H. du Buysson, Feuil. Nat. viii. p. 22.

Aspidomorpha amplissima, Boh. Emendations of original description; C. A. Dohrn, S. E. Z. xxxviii. p. 219. On its variability and relation to *Cassida miliaris*, F.; *id. l. c.* p. 356.

Ctenochira, Chap. The species tabulated; Wagener, *l. c.* pp. 68-79.

Hoplionota dorsalis, sp. n., C. O. Waterhouse, Ann. N. H. (4) xix. p. 424, Queensland.

Cassida angusta and *ellipsodes*, Algeria, *flaviceps*, Syria, spp. nn. [not signed, ? by S. A. de Marsoul], Nouv. et faits (2) No. ix. [for 1876, published with L'Ab. No. 198, dated January 30, 1878, and part of vol. xvi. for 1877 !], p. 35.

WAGENER, l. c., describes the following new species:—

Hoplionota bi-oculata, p. 58, Sumatra.

Porphyraspis reticulata, *ibid.*, S. America.

Prioptera punctipennis, p. 59, Calcutta.

Tauroma bohemani, *ibid.*, Brazil.

Dolichotoma multinotata and *nigro-sparsa*, p. 52, and *nigro-sanguinea*, p. 53, Colombia.

Charidotis steinheili, p. 55, Ocaña.

Physonota pellucida, Demerara, *plicata*, Mexico, p. 61, *brunnea* and *notativentris*, Brazil, and *bipunctata*, Mendoza, p. 62.

Coptocycla heydeni, p. 57, Colombia, *vittata*, p. 66, and *plagifera*, p. 67, Brazil, *subacuminata*, p. 67, E. Peru.

Mesomphalia steinheili, p. 53, W. Colombia, *haroldi*, Valdivia, *marginivittata*, Chimborazo, and *quinque-fasciata*, Colombia, p. 60.

Pæcilaspis semiglobosa, p. 60, Brazil.

Aspidomorpha bi-oculata, locality unknown, and *ramulo-picta*, Brisbane, p. 63, *badeni*, p. 64, Australia.

Hybosa unicolor, Colombia, and *margineguttata*, Brazil, p. 64.

Lacoptera nigricornis, Loango, and *tredecim-guttata*, Manila, p. 65.

Ctenochira flavo-scutellata, *ibid.*, and *uniramosa*, p. 66, Mexico, *nigrocincta* and *semilobata*, p. 55, *varians*, p. 56, Colombia.

EROTYLIDÆ.

Tritoma bipustulata. Larva and pupa described; É. Perris, Ann. Soc. L. Lyon (n.s.), xxiii. p. 410, figs. 574–579.

Languria gracilis, Newm., = *inornata*, Rand., which has priority; E. P. Austin, Canad. Ent. ix. p. 93.

ENDOMYCHIDÆ.

Symbiotes pygmaeus, Hampe, = (*Cryptophagus* ?) *gibberosus*, Luc., *S. lates*, Redt., = (*Nitidula*) *rubiginosus*, Heer. L. Bedel, Bull. Soc. Ent. Fr. (5) vii. pp. xviii. & xix.

Mychophilus, g. n., J. Frivaldszky, Term. füzetek, 1877, p. 19. Near *Clemmus*, but with ten-jointed antennæ. *M. minutus*, sp. n., *id. l. c.* p. 20, pl. i. figs. 2 a–g, Mehadia and Pesth.

Haploscelis abdominalis, sp. n., C. O. Waterhouse, Tr. E. Soc. 1877, p. 13, Madagascar.

COCCINELLIDÆ.

Novius algericus, All., = *10-punctatus*, Ktz., which is from Greece; L. v. Heyden, Deutsche E. Z. 1877, p. 192.

Alexia hirtula, Reitt., nec Kirsch, renamed *pilosella*; E. Reitter, Deutsche E. Z. 1877, p. 296.

Scymnus trojanus, sp. n., E. Mulsant & A. Godart, Ann. Soc. L. Lyon (n.s.) xxii. [for 1875, published in 1876] p. 184, Asia Minor.

Rhizobius aucklandiæ, sp. n., T. Kirsch, Deutsche E. Z. 1877, p. 173, Auckland Isles.

HYMENOPTERA.

BY

E. C. RYE, F.Z.S., M.E.S.

THE GENERAL SUBJECT.

GIRAUD, J. É. Liste des éclosions d'Insectes observées par le Dr. Joseph. Étienne Giraud . . . recueillie et annotée par M. le Dr. Alexandre Laboulbène. Ann. Soc. Ent. Fr. (5) vii. pp. 397-436.

A list of names of parasites, and those of the insects from which they were reared: *Ichneumonidæ*, 254 spp., *Braconidæ*, 119, *Figitidæ*, 17, *Evaniidæ*, 6, *Chrysididæ*, 13, *Chalcididæ*, 344, *Proctotrypidæ*, 21, *Sapygides*, 4, *Mutillidæ*, 1, *Apidæ*, 9 spp.

LUBBOCK, SIR J. Observations on the Habits of Ants, Bees, and Wasps. Pt. IV. J. L. S. xiii. pp. 217-258, pl. xviii. & figs. 1-7.

A continuation of the author's experiments testing intelligence, power of communication, &c. The plate contains figures of well-known species.

PROVANCHER, L. Faune Canadienne. Les Insectes Hyménoptères. Nat. Canad. ix. pp. 346-349, 353-370, figs. 7-15.

The commencement of a descriptive fauna, containing the usual general introductory observations. The *Tenthredinidæ* are placed at the head.

RONDANI, C. Vesparia Parasita non vel minus cognita. Bull. ent. Ital. ix. pp. 166-213, pls. iii. A-vi. A.

Brief descriptions, alphabetically arranged, of parasites belonging to

the *Braconidæ*, *Chalcididæ*, *Ichneumonidæ*, and *Cynipidæ*, with notes of the insects affected by them. New genera and species are characterized, others, apparently new, are not stated to be so; the genera not included in Agassiz, Marshall, or Zool. Rec., are noticed *infra*.

VOLLENHOVEN, S. O. SNELLEN VAN. Pinacographia [Zool. Rec. xi. p. 444, xii. p. 384]. Part 3, pp. 17-24, pls. xi.-xv.; Part 4, pp. 25-32, pls. xvi.-xx., 1876; Part 5, pp. 33-39, pls. xxi.-xxv., 1877. s'Gravenhage, 4to.

Refer to *Ichneumonidæ* (*Ichneumonides*, *Cryptides*, *Tryphonides*, and *Pimplides*), *Braconidæ*, and *Proctotrypidæ*.

WOLFF, O. J. B. Das Riechorgan der Biene, nebst einer Beschreibung des Respirationswerkes der Hymenopteren, des Saugrüssels und Geschmackorganes der Blumenwespen; einer vergleichenden Betrachtung der Riechhaut sämtlicher Aderflüglerfamilien und Erläuterungen zur Geruchs- und Geschmacks- Physiologie überhaupt. Verh. L.-C. Ak. xxxviii. [1876] pp. 1-254, pls. i.-viii.

Discusses and figures in detail the anatomy and physiology of the abdominal, thoracic, and head respiratory organs, with various observations on the phenomena of circulation and respiration; the minute structure and suctorial functions of the mouth-parts in all families of *Hymenoptera* as well as bees; and the olfactory secreting glands in their pathological and chemical aspects, both with regard to workers and queens, and old and young individuals. A comparison is also made of the physiology of smell in the human subject and other animals.

A discussion of the claim of the *Hymenoptera* to be of the highest development in insects; G. Schoch, MT. schw. ent. Ges. v. p. 291.

P. Cameron, P. N. H. Soc. Glasg. iii. pp. 141-152, gives instructions as to capturing, mounting, and rearing phytophagous *Hymenoptera*, with a list of food plants of *Tenthredinidæ* and *Cynipidæ*, noting gall-makers and leaf-miners.

Kriechbaumer, Ent. Nachr. iii. pp. 17-22, discusses various recent publications.

Instances of *Ammophila* and *Odynerus* fixing themselves by their mandibles to twigs, before sleep; S. H. Scudder & B. P. Mann, Psyche, ii. pp. 40 & 41.

England. Notes on new and rare species of aculeate *Hymenoptera*, taken during 1874, 1875, & 1876; F. Smith, Ent. x. pp. 61-67.

South of England (especially as to captures late in the year); E. Saunders, Ent. M. M. xiv. p. 163.

Scotland; P. Cameron, Scot. Nat. iv. p. 11. Additions to the list of Clydesdale *Hymenoptera*, with various notes; *id.* P. N. H. Soc. Glasg. iii. pp. 202-207.

Geneva. Species reared from bramble-stems; E. Frey-Gessner, Ent. Nachr. iii. pp. 94 & 95 (*cf.* Scheuck, l. c. p. 123). At Montpellier; J. Lichtenstein, l. c. p. 140.

Hyères and Venice. Species on the wing in mid-winter ; Lichtenstein, CR. Ent. Belg. xx. p. xiv.

Turkestan. The *Formicidæ* observed by the late A. Fedchenko in his Central Asian journey are described by Mayr, and the *Chrysididæ*, *Mutillidæ*, and *Crabronidæ* by Radoszkovsky, in A. Fedchenko's "Puteshestvie v Turkestan" [Travels in Turkestan]; Part 14, Section ii. Zoogeographicheskia Izledovania. Division 5. These papers form part of vol. xxvi. of Izv. Liub. Est. Antr. Etno. (= Nachr. Ges. Mosc.), and will be noticed *infra*.

North America. The *Hymenoptera* of Kirby's "Fauna Boreali-Americana," described in continuation of a compiled account of the Insects of the northern parts of British America ; C. J. S. Bethune, Canad. Ent. ix. pp. 148-156.

Spitzbergen. Description of species collected by Rev. A. E. Eaton ; T. A. Marshall, Ent. M. M. xiii. p. 241.

APIDÆ.

Andrenides.

Sphecodes. V. von Hagens, Ent. Nachr. iii. pp. 53-55, records his opinions as to the synonymy, &c., of species known to him. Cf. Schenck, *tom. cit.* p. 70.

Andrena varians, K. (*variens*, Rossi, = *Chalicodoma muraria*, F.), and its allies and different forms ; Schenck, *tom. cit.* pp. 120-123.

Colletes punctatus, sp. n., A. Mocsáry, Term. füzetek, 1877, p. 231, Central Hungary.

Prosoxia scutata, sp. n., J. Lichtenstein, Bull. Soc. Ent. Fr. (5) vii. p. cii., Montpellier (coll. construction by ♀ as in *Colletes*) ; also described as new, *id.* Ent. Nachr. iii. p. 141.

Apides.

Rhophites 5-spinosus in England ; F. Smith, P. E. Soc. 1877, p. xxxii.

Megachile centrunculus, Smith. On its habits near Quebec ; L. Provancher, Nat. Canad. ix. pp. 23 & 95.

Anthophora intermedia, Lep., and *astivalis*, Pz., differentiated ; Schenck, Ent. Nachr. iii. pp. 8 & 56. *A. nidulans*, Lep. ; on its northward extension near Mayence ; *id. l. c.* p. 123.

Megilla (Anthophora) garrula, Rossi, *nidulans* and *albigena*, Lep., from Bozen and the north side of the Garda Lake, differentiated, with observations on allied species and their colour varieties ; Kriechbaumer, Ent. Nachr. iii. pp. 87-92.

Osmia camentaria. Account of economy by A. Mocsáry, Term. füzetek, 1877, p. 23. List of *Chrysididæ* parasitic upon *Osmia* and other genera, as supplement to this ; *l. c.* p. 92.

Bombus. O. Radoszkovsky, Bull. Mosc. lii. pt. 2, pp. 169-219, pls. ii. a & ii. b, has published an essay on a new method for facilitating the determination of species belonging to this genus, consisting of an algebraic formula of the length of the palpi, compared with a numerical standard of the length of the wings. The author relies on the compound micro-

scope, and does not hesitate to set aside all other characters employed by former Hymenopterists; even condescending to so futile an argument (speaking against punctuation, relative length of joints of antennæ, &c., hitherto used as diagnostic aids) as that a German or Italian retains his nationality whether or not he be marked with pimples or small-pox, or have little or large ears. Nevertheless, the outlines of palpi will probably be found of considerable use. Thirty-six species are described. *Bombus mendax*, Gerst., = *pomorum*, Pz., var., and the ♂ is described, it being also suggested that the species is synonymous with *alpinus*, L.; there is no difference between *B. senilis*, F., and *B. muscorum*, L.; *B. mesomelas*, Gerst., *intercedens*, Rad., = *elegans*, Seidl.; *B. apicalis*, Mor., = *steweni*, Rad.; *B. nivalis*, Zett., *balteatus*, Dbm., *trifasciatus* and *tunicatus*, Smith, *vorticosus*, Gerst., *niveatus*, Kriechb., = *montanus*, Lep., varr.

Apis mellifica. On the origin, treatment, and cure of foul brood (usually resulting from infection); R. J. Bennett, P. N. H. Soc. Glasg. iii. pp. 192 & 193.

Bees destroyed by *Tritoma* flowers; A. R. Wallace, *Nature*, xvii. p. 45.

Girdwoyn's "Anatomie et physiologie de l'abeille" (Paris: 1875) has not been seen by the Recorder.

Osmia dives, sp. n., A. Mocsáry, Term. füzetek, 1877, p. 232, Pesth.

Melecta jakovlewi, sp. n., O. Radoszkovsky, Hor. Ent. Ross. xii. p. 333, Astracan.

Tetralonia adusta, sp. n., Mocsáry, l. c. p. 233, Central Hungary.

Habropoda balassogloi, sp. n., Radoszkovsky, l. c. p. 334, Etchmiadzin, Caucasus (*Anthophora gracilipes*, Mor., is also a *Habropoda*).

Bombus mocsarii, Kriechbaumer, S. E. Z. xxxviii. p. 253, S.E. Hungary; *B. ussuriensis*, p. 196, Amur, &c., *variabilis* (Schmiedeknecht), p. 199, no locality, *armeniacus*, p. 202, Erivan, *baikalensis*, p. 203 (? Baikal), Radoszkovsky, l. c., spp. nn.

VESPIDÆ.

SAUSSURE, H. DE. Synopsis of American Wasps. Solitary Wasps. Sm.

Misc. Coll. No. 254. Washington: (Decr.) 1875, 8vo, pp. xxxx., 392, pls. i.-iv.

This work, of which the title was given in Zool. Rec. xii. p. 388, has not yet been seen by the Recorder, as the Smithsonian Miscellaneous Collections apparently only reach this country when an entire volume is completed. From a notice in *Psyche*, ii. p. 44, it would appear, in spite of its date, not to have been published even in America until Decr. 1876. From that notice, it would also seem to have been translated from the French by E. Norton, and to contain descriptions of 177 species of America north of the Isthmus of Panama, and 136 South American species, besides 13 from both divisions or of doubtful origin. 25 of the former and 12 of the latter are new, as are the following genera or groups: *Antezumia*, *Metazumia*, *Pseudozumia*, *Nortonia*, *Pach[y]odynerus*, and *Epiponus* (amending *Epipona*).

Vespa cincta eating a species of "Skipper" butterfly, and attracted,

with squirrels, to exuding juice of date-palms, near Barrackpore; G. A. J. Rothney, Ent. M. M. xiii. p. 254. On its nidification; *id. op. cit.* xiv. p. 92.

Vespa germanica gregariously hybernating in a house; G. B. Corbin, Ent. x. p. 144.

F. Rudow, Arch. Ver. Mecklenb. xxx. [1876], p. 188 *et seq.*, describes the *Diploptera* observed in Mecklenburg (45 spp.), with short biological and systematic notes. *Polistes gallica* and *diadema* reared from the same nest.

Polistes hebraeus. On its nidification; G. A. J. Rothney, *op. cit.* xiv. p. 92.

Synagris sp.; nest from Bagamoyo described by H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. clvi.

Celonites abbreviatus, Vill., var. n. *hungaricus*; A. Mocsáry, Term. füzetek, 1877, p. 90, Central Hungary.

Odynerus (Lionotus) aurantiacus, sp. n., Mocsáry, *l. c.* p. 89, Central Hungary.

Hoplopus rugulosus and *ruficornis*, spp. nn., Rudow, *l. c.* p. 234, Mecklenburg.

CRABRONIDÆ.

O. Radoszkovsky, in Fedchenko's "Puteshestvie v Turkestan" [*suprà*, p. 97], pp. 1-83, describes the species taken by that traveller, figuring *Pompilus ruficeps*, Eversm., pl. vi. fig. 12, *Priocnemis flavus*, Ev., pl. vii. fig. 2, *Stizus nigricornis*, Duf., pl. v. fig. 2.

Scoliides.

Scolia hortorum (flavifrons). Observations on its parasitism upon the larvæ of *Oryctes nasicornis* and *O. grypus*; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. lxi.

Sapygides.

Sapyga clavicornis, L., ♂ varr., Schenck, Ent. Nachr. iii. p. 2, Weilburg.

Pompilides.

Pompilus cinctellus, v. d. L.; ♀ varr. connecting it with *sericeus*, V. d. L., described by Schenck, *l. c.* p. 56.

Pepsis formosa paralyzing *Mygale hertzi* with its sting; C. V. Riley, Tr. Ac. St. Louis, iii. (Proc.) p. cclxix.

Aporus testaceus, pl. vi. fig. 5, and *ater*, spp. nn., Radoszkovsky, *l. c.* p. 11, Tschardara.

Salix niger and *micans*, pl. vi. fig. 7, p. 12, *albo-notatus*, p. 13, fig. 6, spp. nn., *id. l. c.* Kizil-kum Desert.

Ceropalus solskii, fig. 8, and *bogdanovi*, fig. 9, p. 13, *nigra*, p. 14, fig. 10, spp. nn., *id. l. c.* pl. vi., Turkestan.

Pompilus argenteo-fulvo [sic, and on pl. !], p. 15, pl. vi. fig. 13, *testaceus* and *vagans*, p. 16, *niger* and *maculatus*, p. 18, *albo-fasciatus*, *rufiventris*,

pl. vi. fig. 14, and *kizilkumii* [-*manus*, vel -*mensis*], p. 19, spp. nn., *id. l. c.* Turkestan.

Priocnemis sarafschani [-*na*, vel -*nensis*], pl. vii. fig. 3, and *moravitzky* [sic], fig. 1, spp. nn., *id. l. c.* p. 22, Sarafschan.

Sphegides.

Chlorion lobatum. On its exhibition of high instinct; G. A. J. Rothney, Ent. M. M. xiv. p. 91.

Pelopæus pensilis, Latr. Larva and nidification described, from Algiers; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. xcii.

Podium maracandicum, sp. n., Radoszkovsky, *l. c.* p. 7, pl. iv. fig. 2, Samarcand.

Sphex stschurovskii, p. 7, pl. iv. fig. 1, *sirdariensis* and *conica*, p. 9, spp. nn., *id. l. c.*, Turkestan.

Larrides.

Pison ater in company with a *Chrysis* (? *ignita*) in nest of *Pelopæus*, having probably merely utilized the work of the latter; É. Perris, Bull. Soc. Ent. Fr. (5) vii. p. 383.

Ammosphecidium, g. n., F. F. Kohl, Verh. z.-b. Wien, xxvii. [for 1877, published in 1878], pp. 701-705, figs. 1 & 2 (wing neuration). Probably between *Miscophus* and *Dinetus*, but with affinities to *Alyson* and *Cerceris*. *A. helleri*, sp. n., *id. l. c.*, South Tirol.

Gastrosericus maracandicus, sp. n., Radoszkovsky, *l. c.* p. 23, pl. iv. fig. 3, Samarcand.

Tachytes vaga, p. 25, pl. iv. fig. 5, *maracandica*, fig. 7, and *kizilkumii* [-*manus* vel *mensis*], fig. 6, p. 26, *incerta*, p. 28, *micans*, p. 29, fig. 4, *fugax*, p. 30, *id. l. c.*, Turkestan; *T. acrobates*, Kohl, *l. c.* p. 705, N. and S. Tirol: spp. nn.

Astata maculata, pl. iv. fig. 9, and *frontalis*, p. 31, 4-*punctata*, p. 32, fig. 8, Radoszkovsky, *l. c.*, Turkestan; *A. femoralis*, A. Mocsáry, Term. füzetek, 1877, p. 89, Northern Hungary: spp. nn.

Bembicides.

Bembex rostrata, near St. Malo, carrying, as food for its larvæ, species of *Eristalis*, *Volucella*, *Stratiomys*, *Syrphus*, *Helophilus*, *Bombylius*, &c.; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. cl.

Bembex dilatata, pl. v. fig. 12, and *bicolor*, fig. 15, p. 47, *femoralis*, pl. vi. fig. 4, and *sarafschani* [-*nica*, vel -*nensis*], pl. v. fig. 13, p. 48, *lutescens*, pl. vi. fig. 2, and *eburnea*, pl. v. fig. 14, p. 49, *pallida*, pl. vi. fig. 1, and *bi-punctata*, fig. 3, p. 50, spp. nn., Radoszkovsky, *l. c.*, Turkestan.

Nyssonides.

Radoszkovsky, *l. c.*, describes the following new genera and species:—*Olgia*, p. 33 [differential characters in Russian]. *O. modesta*, *ibid.* pl. v. fig. 2, Kizil-kum Desert, Sarafschan.

Kaufmannia, p. 43. Resembling *Pargia* or *Ceramius*. *K. maracandica*, *ibid.* pl. v. fig. 10, River Jaxartes.

Alyson maracandensis, pl. iv. fig. 10, and *incertus*, p. 34, Turkestan.

Stizus fedtschenkoi, p. 34, pl. iv. fig. 12, *rufiventris*, fig. 11, and *lutescens*, fig. 12, p. 36, *eversmanni* and *kizilkumii* [-*manus* vel -*mensis*], pl. v. fig. 1, p. 37, *ulianini*, p. 38, pl. iv. fig. 14, *unifasciatus*, p. 39, pl. v. fig. 3, Turkestan.

Hoplisis rufo-nodis [rufin-], p. 41, pl. v. fig. 5, *luxuriosus*, p. 42, fig. 4, Turkestan.

Nysson grandissimus, fig. 9, and *argenteo-fasciatus*, fig. 7, p. 44, *castaneus*, fig. 8, and *incertus*, fig. 6, p. 45, pl. v., Turkestan.

Enthomosericus [sic] *kaufman*[n]i, p. 46, pl. vii. fig. 4, Turkestan.

Crabronides.

Orybeloides, g. n., Radoszkovsky, l. c. p. 68; for *O. fasciatus*, sp. n., *ibid.*, pl. viii. fig. 3, Turkestan.

Orybelus fedtschenkoi, pl. viii. fig. 7, and *sarafschanii* [-*nicus*], fig. 8, p. 69, *parvulus*, fig. 6, and *elongatus*, fig. 5, p. 70, *maracandicus* and *kizilkumii* [-*micus*, vol -*mensis*], fig. 12, p. 71, *solskii*, fig. 3, and *eburneus*, fig. 4, p. 72, *canaliculatus*, fig. 11, and *albo-pictus*, p. 73, spp. nn. *id.* l. c. Turkestan.

Crabro urophori, p. 78, *C. (Thyreopus) filiformis*, pl. viii. fig. 14, and *ulianini*, fig. 13, p. 79, spp. nn., *id.* l. c. Turkestan.

Lindenius gredleri, sp. n., F. F. Kohl, Verh. z.-b. Wien, xxvii. p. 707, N. Tirol.

Crossocerus tirolensis, sp. n., *id.* l. c. p. 709, N. & S. Tirol.

Stizus minutissimus, sp. n., Radoszkovsky, l. c. p. 65, Turkestan.

Passalwex parvulus, sp. n., *id. ibid.*, Turkestan.

Philanthides.

Philanthus kokandicus, p. 52, Schachimardan, and *kizilkumii* [-*micus*, vel -*mensis*], p. 53, pl. vii. fig. 5, R. Jaxartes, spp. nn., Radoszkovsky, l. c.

Cerceris acuta, pl. vii. fig. 6, and *sirdariensis*, fig. 13, p. 54, *octo-notata* and *rufo-nodis* [rufin-], p. 56, *maracandica*, pl. vii. fig. 9, *maculata*, pl. viii. fig. 2, and *freymuthi*, pl. vii. fig. 8, p. 57, *mixta* and *quadripunctata*, pl. vii. fig. 12, p. 58, *pallido-picta*, pl. vii. fig. 11, and *solskii*, p. 59, *saussurii*, p. 60, pl. vii. fig. 7, *vagans*, p. 61, spp. nn., *id.* l. c., Turkestan.

MUTILLIDÆ.

Radoszkovsky, l. c. pp. 28-42, describes the species taken by Fedchenko, figuring *Mutilla quinquefasciata*, Ol., pl. iii. fig. 3, *cephalica* Rad., fig. 5, *decorata*, Sav., fig. 6, *ornata*, Kl., fig. 10.

Mutilla europæa in the north of France; V. Colin de Plancy, Feuil. Nat. viii. p. 19.

Mutilla incerta, p. 38, pl. iii. fig. 7, *fedtschenkoi*, p. 39, fig. 8, *anceps*, p. 40, fig. 9, *sarafschanii*, p. 41, figs. 11 & 12, spp. nn., Radoszkovsky, l. c., various Turkestan localities.

FORMICIDÆ.

McCook, H. O. On the vital powers of Ants. P. Ac. Philad. 1877, pp. 134-137.

Camponotus pennsylvanicus enduring forty-eight hours' freezing on ice, and *Formica rufa* only sluggish at 30° F.; *C. pennsylvanicus*, surviving, though contained in a stump burning on a camp fire, and *Myrmica molefaciens* inhabiting for five years a mound on which blacksmiths' fires were habitually built up; *Formica rufa* and another ant reviving after a night's submergence in five inches of rain water.

Ants destroying the wings of subterranean *Aphides* and species of *Tettigometra*, apparently to prevent them from leaving their nests; J. Lichtenstein, MT. schw. ent. Ges. v. p. 301.

Circumspection in ants; Leidy, P. Ac. Philad. 1877, p. 320.

Formica flava in possession of large numbers of a species of *Aphis*, a *Coccus*, and the larva of an insect, probably Coleopterous, all carefully tended; *id.* l. c. p. 145.

Formica rufa. H. C. McCook, "Mound-making Ants of the Alleghanies, their architecture and habits," Tr. Am. Ent. Soc. vi. pp. 253-296, pls. ii.-v. (photogr.), and figs. 1-13, describes very fully the habits, economy, engineering, guests, enemies, &c., of this species. Nests 40 in. high and 36 ft. in circumference, described; *id.* Am. Nat. xi. p. 61.

Lasius incisus, Skk., and *umbratus*, N., frequenting trees; *L. incisus* and *fuliginosus* in company, Schenck, Ent. Nachr. iii. p. 2. *L. incisus* = *affinis*, Sch.; *id.* (quoting Forel) l. c. p. 55.

Ponera ochracea (?), worker, in Britain; R. S. Charsley, Ent. M. M. xiv. p. 69. Afterwards described as new, *id.* l. c. p. 162.

EMERY, C. Saggio di un Ordinamento naturale dei Mirmicidae, e considerazioni sulla filogenesi delle Formiche. Bull. Ent. Ital. ix. pp. 67-83, pl. i.

After a reference to Mayr's views, the author divides the ants into four tribes, or sub-families, *Formicidæ*, *Poneridæ*, *Myrmicidæ*, and *Dorylidæ*, retaining the latter, though aberrant. The *Myrmicidæ* are composed of five groups, *Myrmeciidæ*, *Cryptoceridæ*, *Myrmicidæ genuinæ*, *Phidolidæ*, and *Attidæ*. The third and fourth of these have hitherto been subject to much confusion, but are essentially characterized by their thoracic structure and the venation of their anterior wings. *Cremastogaster* should, perhaps, form a separate group. *Eciton* should not be placed in the *Attidæ*. A list is given of the genera belonging to these groups; and the plate represents venation and other points of external anatomy illustrating the author's views, which are criticised by G. Mayr in Verh. z.-b. Wien, xxvii. SB. pp. 23-26.

Myrmica ruginodis stridulating; A. H. Swinton, P. E. Soc. 1877, p. xv.

Myrmica molefaciens, Buckley (= *barbata*, Smith), queried as a *Pogonomyrmex*, teste Forel. Observations on its formicarium, and corroboration of its habit of collecting and storing seeds, and removing shells and refuse. H. C. McCook, P. Ac. Philad. 1877, pp. 299-304. The reported

sowing of a crop, somewhat favoured by McCook, objected to by J. Leidy, *l. c.* p. 304.

Diplorrhoptum domesticum in swarms at Stockport; S. H. Gaskell, Ent. M. M. xiii. p. 254.

Pseudomyrma, a list with references and localities of 40 known species, and *Tetraponera*, the like of 9 species (*Sima compressa*, Rog., = *T. allaborans*, Walk., redescribed), with new species of both genera; F. Smith, Tr. E. Soc., 1877, pp. 57-68, 68-72.

Micromyrma, Duf., substantiated as distinct from *Tapinoma*; and the name *dufouri* proposed for *M. pygmaea*, in case of objection to the same specific name being employed twice in the same tribe [1]; É. Perris, Ann. Soc. Ent. Fr. (5) vii. pp. 379-382.

G. Mayr, Verh. z.-b. Wien, xxvii. [for 1877, published in 1878], pp. 867-878, enumerates species found in N. Brazil by Prof. Traill, of Aberdeen. *Camponotus senex*, Smith, ♂, ♀, and worker, and *Liometopum xanthochroum*, Rog. (? = *instabile*, Sm.), are described.

G. MAYR, in Fedchenko's "Puteshestvie v Turkestan" [*suprà*, p. 97], pp. 1-21, describes the species taken by that traveller.

C. Emery, Ann. Mus. Genov. ix. pp. 363-381, describes 32 species found by Antinori, Beccari, and Issel near the Red Sea and in the Bogos country.

New genera and species :—

Melissotarsus, Emery, *l. c.* p. 378. Near *Ooceraea*; first joint of tarsi very large, incrassate, subquadrate; antennæ short, 6-jointed, with 2-jointed club; worker differing from soldier in mandibles only. *M. beccarii*, p. 379, figs., Keren.

Ochetomyrmex, Mayr, Verh. z.-b. Wien, xxvii. p. 871. Near *Tetramorium* and *Leptothorax*; antennæ with a 3-jointed club, the apical joint fusiform. *O. semipolitus* (worker), p. 872, N. Brazil.

Allomerus, id. *l. c.* p. 873. Allied to *Pristomyrmex*, with the anterior margin of clypeus strongly arched, simple, narrowly depressed, and acute. *A. decem-articulatus*, *octo-articulatus*, and *septem-articulatus* (workers only), p. 874, N. Brazil.

Camponotus carbo, Emery, *l. c.* p. 364, fig., Sciotel; *C. traili*[1], Mayr; *l. c.* p. 868, N. Brazil; *C. fedtschenkoi*, p. 3, *interjectus*, p. 4, Mayr, Putesh. Turkestan, Turkestan.

Formica aberrans, Mayr, *l. c.* p. 7, Sarafschan Valley.

Cataglyphis pallida, id. *l. c.* p. 9, Kizil-Kum Desert.

Polyrrhachis antinorii, Emery, *l. c.* p. 365, fig., Sciotel, Keren.

Ponera crassa, id. *l. c.* p. 366, fig., Sciotel; *P. tarda*, R. S. Charsley, Ent. M. M. xiv. p. 162, Britain.

Ischnomyrmex raphidiiceps, Mayr, *l. c.* p. 12, Sarafschan.

Monomorium barbatum, id. *l. c.* p. 17, Kizil-Kum Desert; *M. bicolor*, Emery, *l. c.* p. 368, Sciotel.

Tetramorium sericeiventris, p. 370, Sciotel, *pygmaum*, p. 371, Keren, Emery, *l. c.*

Aphenogaster clavata, id. *l. c.* p. 372, Keren.

Liometopum brevicorne, Mayr, Verh. z.-b. Wien, xxvii. p. 870, N. Brazil.

Phidole speculifera, p. 373, Ainsaba, *rugaticeps*, p. 375, Sciotel, Emery, l. c. ; *P. minutula*, Mayr, l. c. p. 872, N. Brazil.

Solenopsis tenuis, Mayr, l. c. p. 874, N. Brazil.

Cremastogaster subdentata, id. Putesh. Turkest. p. 19, Turkestan ; *C. brasiliensis*, p. 875, *lavis*, p. 876, id. Verh. z.-b. Wien, xxvii., N. Brazil ; *C. robusta*, Emery, l. c. p. 379, Keren.

Pseudomyrma latinoda, Mayr, Verh. z.-b. Wien, xxvii. p. 877, N. Brazil ; *P. levigata*, p. 62, *leviceps*, p. 63, *rufa*, *terminalis*, and *simplex*, p. 64, *urbana*, p. 65, *canescens* and *penetrator*, p. 66, *sedula*, p. 67, and *unicolor*, p. 68, Brazil (mostly Amazon River), *variabilis* and *pilosula*, p. 62, Barbadoes, *distincta* and *brunnea*, p. 63, *ferruginea*, p. 64, *fervida* and *volatilis*, p. 65, and *elongata*, p. 67, Mexico, *rufo-media*, p. 66, Guatemala, *flavicornis*, p. 67, Nicaragua, Smith, Tr. E. Soc. 1877.

Tetraponera petiolata, p. 70, Ceylon, *attenuata*, Sarawak, and *aethiops*, S. Africa, p. 71, *punctulata*, p. 72, W. Australia, id. l. c.

CHRYSIDIDÆ.

O. Radoszkovsky, in Fedchenko's "Puteshestvie v Turkestan" [*suprà*, p. 97], pp. 1-27, describes (under the peculiar name "Chrysidiformis") the species taken by that traveller, which are also excellently figured on pls. i., ii., & iii., including *Chrysis varicornis*, Spin., pl. i. fig. 4, *versicolor*, Spin., fig. 6, *foveata*, Dbm., fig. 7, *ehrenbergi*, Dbm., fig. 10, *palliditarsis*, Spin., fig. 11, *orientalis*, Dbm., fig. 12, *diversa*, Dbm., pl. ii. fig. 2, *soror*, Dbm., pl. i. fig. 3, *sinuata*, Dbm., pl. ii. fig. 5, *grohmanni*, Spin., fig. 7, *impar*, Dbm., fig. 9, *micans*, Rossi, fig. 10.

E. Abeille de Perrin, Feuil. Nat. vii. pp. 57-59, 66-68, describes his method of collecting, and gives diagnoses of new species. He enumerates 50 species that have occurred to him (in S. France, chiefly). Indications of other new species are given. *Chrysis insperata*, Chevr., *C. rutila*, Perris, = *splendidula*, Rossi ; *C. viridula*, Dahlb., var. n. *fenestrata*, p. 67.

Chrysis. List of 10 species and the other *Hymenoptera* on which they are respectively parasitic ; J. Lichtenstein, Term. füzetek, 1877, p. 92.

Chrysis simplex, Dhlb., parasitic on *Osmia cæmentaria*, Gerst. ; A. Mocsáry, Term. füzetek, 1877, p. 23.

Polyodontus, g. n., Radoszkovsky, l. c. p. 25. Next after *Stilbum*, abdomen with eleven teeth at apex in figure (characters in Russian). *P. schurovsky* [sic], sp. n., id. *ibid.* pl. iii. fig. 2, locality unknown.

Brugmotia, g. n., id. l. c. p. 26. Allied to *Euchæus*. *B. pellucida*, sp. n., id. *ibid.* pl. ii. fig. 12, Kizil-Kum Desert.

Cleptes morawitzi, sp. n., id. l. c. p. 1, pl. iii. fig. 3, Samarcand, &c.

Hoplopyga bogdanovi, sp. n., id. l. c. p. 5, pl. i. fig. 1, Sarafschan.

Homatus triangulifer, sp. n., E. A. de Perrin, Feuil. Nat. vii. p. 65, Ste. Baume.

Hedychrum sculpturatum and *longicollis*, id. *ibid.*, Marseilles and Toulon ;

H. erschovi, p. 6, pl. i. fig. 2, Sarafschan, *solsky* [sic], p. 7, pl. iii. fig. 1, Kizil-Kum Desert, Radoszkovsky, *l. c.*, spp. nn.

Chrysis vagans, p. 11, pl. i. fig. 3, *fedtschenkoi*, p. 12, fig. 5, *maracandensis*, p. 14, fig. 8, *dentipes*, p. 15, fig. 9, *speciosa*, p. 17, pl. ii. fig. 1, *kokandica*, p. 18, fig. 2, *superba*, p. 20, *kessleri*, p. 21, pl. ii. fig. 6, *ulianini*, p. 22, fig. 8, *sabulosa*, p. 24, fig. 11, spp. nn., Radoszkovsky, *l. c.*, various Turkestan localities.

Chrysis lais, Var, *gribodoi*, and *virgo*, La Penne, p. 66, *dominula*, Toulon, and *chevrieri*, Switzerland, p. 67, *igniventris*, La Penne, and *cerastes*, Lorgues and La Penne, spp. nn., Perrin, *l. c.*

ICHNEUMONIDÆ.

F. W. WOLDSTEDT, Bull. Pétersb. xxii. pp. 390–402, describes known and new species from Silesia.

Undetermined parasite on eggs of *Culeptenus apretus* described and figured in the larval state; C. V. Riley, Rep. Ins. Mo. ix. p. 96, fig. 24.

Ichneumonides.

E. T. CRESSON, Tr. Am. Ent. Soc. vi. pp. 129–212, under the modest title "Notes on the species belonging to the subfamily *Ichneumonides*, found in America north of Mexico," has published a laborious and valuable treatise (practically a monograph) upon those insects, following Holmgren's arrangement, and giving dichotomous sexual tables. 201 spp. of *Ichneumon*, 4 of *Hoplismenus*, 35 of *Amblyteles*, 22 of *Trogus*, 11 of *Platylabus*, 1 of *Eurylabus*, and 16 of *Phæogenes* are described (many new). Observations are made on probable synonymy of species unknown except by description to the author, and the following synonymic and other corrections are given:—*Ichneumon hilaris*, Say, probably belongs to the *Pimplides*; *I. blakii*, Cress., and *Ischnus contiguus*, *iridescens*, and *albitarsis*, Cress., belong to *Cryptus*; *Ichn. inquisitor* and *pteras*, Say, belong to *Pimpla*; *I. fortis*, Prov., and ? *flavicornis*, Cress., = *centrator*, Say; *I. cinctipes*, Prov., = *navus*, Say; *I. pullatus*, Cress., = *subcyaneus*, Cress., ♀; *Phygadeuon niger*, Prov., = *I. extremitatis*, Cress.; *I. signatipes*, Prov., nec Cress., renamed *stygius* (p. 151); *Ischnus jejunos*, Cress., and *proximus*, Cress., = *sublatus*, Cress., var. *wilsoni*, Cress., *vinnulus*, Cress., and other species are referred to *Ichneumon*; *I. niger*, Brullé, = *unifasciatus*, Say; *I. varipes*, Prov., nec Grav., = *cinctitarsis*, Prov.; *I. mellicoxus*, Prov., = *puerilis*, Cress.; *Phygadeuon ater*, Prov., = *I. helvipes*, Cress.; *I. nobilis*, Cress., nec Wesm., renamed *munificus* (p. 162); *I. multor*, Cress., = *flavizonatus*, Cress., and ? = *jucundus*, Brullé, ♂; *I. clopini*, Prov., = *milvus*, Cress.; *Mesostenus apicalis*, Prov., = *I. finitimus*, Cress., var., and the latter ? = *terminalis*, Cress., ♂; *I. ventralis*, Cress. (Tr. Am. Ent. Soc., nec P. Ent. Soc. Philad.), renamed *vecors*, p. 172; *Phygadeuon nigro-variegatus*, Prov., *P. dorsalis*, Prov., = *humilis*, Prov., var., and *P. terminalis*, Prov., = *caudatus*, Prov., referred to *Ichneumon*; *I. regnatrrix* and *ambiguus*, Cress., = *grandis*, Brullé; *I. incertus*, *semicoccineus*, and *californicus*, Cress., = *rufiventris*, Brullé; *Joppa canadensis*, Prov., = *Ichn. insolens*, Cress.; *I. hesitans*, Prov., = *funestus*,

Cress.; *Ischnus variegatus*, Prov., = *w-album*, Cress., which is an *Ichneumon*; *I. lobatus*, Prov., = *duplicatus*, Say; *Mesostenus annulatus*, Prov., is an *Ichneumon*; *I. pusillus*, Cress., = *annulipes*, Cress.; *I. obsoletus*, Riley, = *brevipennis*, Cress., var.; *I. calcaratus*, Prov., = *Hoplismenus morulus*, Say; *Amblyteles aequalis*, Prov., = *consimilis*, Cress., nec Wesm., renamed *nubivagus*, p. 193 [*aequalis*, Prov., stands]; *A. marianapolitansensis*, Prov., = *rufizonatus*, Cress.; *A. nitidus*, Prov., = *electus*, Cress.; *Phygadeuon insignis*, Prov., = *I. hebrus*, Cress., and *P. hilaris*, Prov., = *I. helvus*, Cress., both being referred to *Phaeogenes*; and many species already known are referred to their proper genera.

WOLDSTEDT, F. W. Beitrag zur Kenntniss der um St. Petersburg vorkommenden Ichneumoniden. Bull. Pétersb. xxiii. pp. 432-460.

Enumerates the known species (and 6 new), with bibliographical references.

Ichneumon lineator, Grav., fig. 1, *restaurator*, Gr., fig. 2, *bilineatus*, Gr., fig. 3, *sugillatorius*, L., fig. 4, *comitator*, L., fig. 5, *leucocerus*, Gr., fig. 6, *castaniventris*, Gr., fig. 7, *insidiosus*, Wesm., fig. 8; S. C. Snellen van Vollenhoven, Pinacographia, pl. xx. (general observations on them, pp. 31 & 32).

Ichneumon germanus, p. 143, *citinus*, p. 144 (? = *torvinus*, Cress., ♀), *chalybeus*, p. 146, *pepticus* and *merus*, p. 148, *vitalis* and *mendax* (also Canada), p. 149, *truculentus*, p. 150, *promptus*, p. 152, *recens*, p. 153, *gestuosus* (also British Columbia), p. 156, *dictiosus*, p. 164, *restrictus* (? = *instabilis*, Cress., var.), p. 169, *leviculus*, p. 170, *putus*, p. 173, *ultimus*, *vivax*, and *vafes*, p. 178, *libens*, p. 181, *scibilis*, p. 183, various Northern States, *I. scriptifrons*, p. 144, *pervagus*, p. 148, *atrox* and *pravus*, p. 151, *bi-oculatus*, p. 158, *uncinatus*, p. 159, *suadus*, p. 160, *versabilis*, p. 161, *procax*, p. 170, *saundersi*, p. 177, *confirmatus*, p. 178, *flebilis*, p. 181, *nanus*, p. 184, Canada (some also from U.S.A.); *I. texanus*, p. 159, and *heiligbrodti*, p. 168, Texas, *I. seditiosus*, p. 172, Colorado, Cresson, l. c.; *I. bimembris*, *citatus*, and *trizonatus*, p. 8, *vescus* and *pomilius*, p. 9, *lividulus*, p. 10, Provancher, Nat. Canad. ix., Canada: spp. nn.

Amblyteles tetricus and *perluctuosus*, Provancher, l. c., p. 10, Canada; *A. diasemæ*, Tischbein, S. E. Z. xxviii. p. 497, Finland, from pupæ of *Plusia diasema*; *A. belangeri*, Canada, *illetabilis*, Georgia, p. 190, *taos*, p. 191, New Mexico, *hudsonicus*, Hudson's Bay Territory, *fraternus*, Massachusetts, p. 192, *coloradensis*, p. 193, Colorado, Cresson, l. c.: spp. nn.

Trogus fascipennis, p. 195, Texas, *brullæi*, p. 196, various Northern States, *apicalis*, p. 197, Georgia, spp. nn., Cresson, l. c.

Platylabus canadensis, Canada, *montanus*, New Hampshire, spp. nn., id. l. c. p. 200.

Eurylabus agilis, sp. n., id. l. c. p. 201, Canada and United States.

Phaeogenes ater, p. 202, *decoloratus*, and *discus*, p. 203, spp. nn., id. l. c., United States.

Cryptides.

Taschenberg, Z. ges. Naturw. xlviii. [1876] pp. 61-104, describes various

tropical new species, chiefly from South America. *Cryptus longiseta*, Tasch., redescribed, p. 62; *C. violaceipennis*, Brullé, ♂, p. 67.

Parasites on parasites: *Cryptus nubeculatus* bred from cocoon of *Exetastes*, and *C. titillator* from *Campoplex pugillator*; Brischke, Deutsche E. Z. 1877, p. 286. *Hemiteles fulvipes*, Gr., reared from a mass of *Microgaster glomeratus*; id. l. c. p. 287.

Pezomachus. General observations, and figures of *P. neesi*, fig. 1, *edentatus*, fig. 2, *nigritus*, fig. 3, *bellicosus*, fig. 4, *nigricornis*, fig. 5, *cyanurus*, var., fig. 6, *formicarius*, fig. 9, *corruptor*, fig. 10, and *meigeni*, fig. 11, Först., *fasciatus*, Fab., fig. 7, *vagans*, Ol., fig. 8; S. C. Snellen van Vollenhoven, Pinacographia, pp. 18–20, pl. xii.

Cryptus albo-marginatus, p. 72, *sericeus*, p. 63, *opaco-rufus*, p. 64, *lateritus*, p. 65, Parana, *chalybeus*, p. 63, Mendoza, *fulvus*, p. 66, Mexico, *dimidiatus*, p. 68, Lagoa Santa, *laticeps*, p. 68, *trifasciatus*, p. 69, Java, Taschenberg, l. c.; *C. avidus* and *scrutator*, Woldstedt, Bull. Pétersb. xxii. p. 398, Silesia; *C. scutellatus* and *montivagus*, p. 12, *imitator* and *affabilis*, p. 13, Provancher, l. c. Canada: spp. nn.

Linoceras testaceum, p. 71, Brazil and Venezuela, *testaceo-nigrum*, p. 73, and *thoracicum*, p. 74, Brazil, spp. nn., Taschenberg, l. c.

Mesostenus testaceus and *leucostomus*, p. 76, *nigro-lineatus*, p. 79, *zebra*, p. 82, *ruficrus*, p. 85, *v-album*, p. 86, *sanguineus* and *leucopygus*, p. 89, *propinquus* and *apertus*, p. 90, *denticulatus*, p. 93, *luxuriosus*, p. 94, Brazil, *maculipennis*, p. 78, *robustus*, p. 84, Lagoa Santa, *callosus*, p. 80, *albinaculatus*, p. 86, *curvipes*, p. 88, *rufithorax*, p. 92, Rio Janeiro, *areolatus*, p. 81, S. America, *stramineus*, p. 83, *pilosus*, p. 87, Venezuela, *violascens*, p. 91, Parana, spp. nn., id. l. c.

Phygadeuon inhabilis, *segnis*, and *crassipes*, p. 11, *rotundiceps*, p. 12, Provancher, Nat. Canad. ix., Canada; *P. brischkii*, Woldstedt, Bull. Pétersb. xxii. p. 397, Silesia: spp. nn.

Hemiteles rufipes, p. 96, Mendoza, *jucundus*, p. 97, *trifasciatus* and *nigromaculatus*, p. 101, *trimaculatus*, p. 102, Brazil, *albo-annulatus*, p. 98, *hemorrhoidalis*, p. 100, Lagoa Santa, *affinis*, p. 99, Rio Janeiro, *scutellaris*, p. 103, *rufus*, p. 104, Parana, spp. nn., Taschenberg, l. c.

Ophionides.

Exetastes. General observations and figures of *E. fornicator*, F., fig. 2, *clavator*, F., fig. 3, *illusor*, fig. 4, *bicoloratus*, Gr., fig. 5, *femorator*, Desv., fig. 6, *guttatorius*, Gr., fig. 7, *notatus*, Holmgr., fig. 8, *crassus*, Gr., fig. 9; S. C. Snellen van Vollenhoven, Pinacographia, pp. 26 & 27, pl. xvii.

Limneria robusta and *spreti*, spp. nn., Woldstedt, Bull. Pétersb. xxii. p. 394, Silesia.

Mesochorus dolorosus, sp. n., T. A. Marshall, Ent. M. M. xiii. p. 242, Hecla Cove, Spitzbergen.

Porizon borealis, sp. n., Provancher, Nat. Canad. ix. p. 14, Canada.

Exetastes rufo-femoratus, sp. n., id. *ibid.*, Canada.

Banchus ferrugineus, sp. n., id. *ibid.*, Canada.

Zachrestia insignis, sp. n., Woldstedt, op. cit. xxiii. p. 436, St. Petersburg.

Tryphonides.

General observations on the group; S. C. Snellen van Vollenhoven, *Pinaacographia*, pp. 34 & 35. *Mesoleptus* dubiously considered separable from *Mesolius*; *Mesolius opticus* bred from *Nematus virescens*, and *M. sanguinicollis* from gall of a willow-frequenting *Nematus*, p. 36. *Tryphon elongator*, F., fig. 1, *brachyacanthus*, Gmel., fig. 2, *rutilator*, L., fig. 3, *vulgarius*, Holm., fig. 4, *trochanteratus*, Holm., fig. 5, *consobrinus*, Holm., fig. 6, *signator*, Gr., fig. 7, *fulviventris*, Holm., fig. 8, *ephippium*, Holm., fig. 9, pl. xxii.; *Mesolius rufus*, Gr., fig. 1, *aulicus*, Gr., fig. 2, *caligatus*, Gr., fig. 3, *opticus*, Gr., fig. 4, *furax*, Holm., fig. 5, *sanguinicollis*, Gr., fig. 6, *hamatodes*, Gr., fig. 7, *lophyrorum*, Htg., fig. 8, *ophthalmicus*, Holm., fig. 9, pl. xxiii.; *id. l. c.*

HOLMGREN, A. E. Dispositio Synoptica Mesoleiorum Scandinaviæ. Sv. Ak. Handl. xiii. No. 12 [1876], pp. 1-51.

129 species are described, whereof 33 are new. Some little synonymy is given.

Tryphon prægator, L. & Grav.; observations on determination, and indication of the ♀ of Gravenhorst's species being a *Mesolius*; S. C. Snellen von Vollenhoven, *Tijdschr. Ent.* xx. p. 64.

Scolobates discussed as to systematic position and species; *S. coralinus*, Voll., = *italicus*, Gr., and is considered a true *Tryphon*. Kriechbaumer, *Ent. Nachr.* iii. pp. 133-137, 149 & 150.

Eidemopsis rogenhoferi, Tschek, = *Tryphon scabriculus*, Grav., ♀, reared from *Cladius difformis*; Brischke, *Deutsche E. Z.* 1877, p. 285.

Bassus fissorius, Gr., has no areolet; Ratzeburg's *fissorius* is probably not this species. Kriechbaumer, *l. c.* p. 166.

Euryproctus aberrans, sp. n., Woldstedt, *Bull. Pétersb.* xxii. p. 400, Silesia.

Perilissus færsteri, *id. ibid.*, Silesia, *dissimilis*, *id. op. cit.* xxiii. p. 458, St. Petersburg: spp. nn.

Mesolius ephippiger and *senilis*, p. 4, *spectabilis*, p. 8, *suspicax*, p. 9, *silvarum* and *sepulchralis*, p. 10, *ventosus*, p. 11, *wahlbergi*, *astutus*, and *assiduus*, p. 13, *alpestris* and *solitarius*, p. 14, *patagiatus*, p. 15, *modestus*, p. 16, *commotus*, p. 17, *curvicrus* (*melancholicus*, Holmg., *olim*), *exiguus*, and *contrarius* (*sylvestris*, Holmg., *olim*), p. 18, *pervicax*, *sobrinus*, and *efferus*, p. 19, *circumspectus*, p. 20, *difformis*, p. 24, *celator* and *facetus*, p. 29, *torvus*, p. 30, *rufo-notatus*, p. 31, *corrugatus*, p. 35, *perturbatus*, p. 36, *aquabilis*, p. 37, *filicornis*, p. 40, *erythrogaster*, p. 44, *præcatorius*, p. 48, Holmgren, *l. c.*, various Scandinavian localities; *M. decipiens* and *infidus*, p. 401, *punctulatus*, p. 402, Woldstedt, *Bull. Pétersb.* xxii., Silesia; *M. arctophylax*, T. A. Marshall, *Ent. M. M.* xiii. p. 241, Wide Bay, Spitzbergen; *M. antennatus*, Provancher, *Nat. Canad.* ix. p. 15, Canada: spp. nn.

Polyblastus rizador, sp. n., Woldstedt, *l. c.* p. 399, Silesia.

Cteniscus (*Diaborus*) *sedulus*, sp. n., *id. op. cit.* xxiii. p. 455, St. Petersburg.

Trichocalymma plebeium and *punctatum*, p. 456, *bipunctatum*, p. 457, spp. nn., *id. l. c.*, St. Petersburg.

Exyston variatus [-*tum*], sp. n., Provancher, *l. c.* p. 15, Canada.

Erochus scitulus, sp. n., *id. ibid.*, Canada.

Orthocentrus reptilis, Marshall, *l. c.* p. 242, Loom Bay, Spitzbergen; *O. nigristernus*, C. Rondani, Bull. Ent. Ital. ix. p. 192, in larvæ of *Balaninus glandium*, Italy: spp. nn.

Bassus hyperboreus, sp. n., Marshall, *l. c.* p. 241, Wide Bay.

Metopius sinensis, sp. n., F. Smith, P. Z. S. 1877, p. 411, pl. xlv. fig. 4, Shanghai (the first known of its genus from China, India, or the Eastern Archipelago).

Pimplides.

C. G. THOMSON, Opusc. Ent. (fasc. 8) pp. 732-777, characterizes the genera and species found in Sweden.

Rhyssa. S. C. Snellen van Vollenhoven refers in a general way to the characters and known species of this genus, in which he includes *Thallessa* as of insufficient generic value, figuring *R. clavata*, F., figs. 1 & 2, *superba*, Schr., figs. 3 & 4, *persuasoria*, L., figs. 5 & 6, and *curvipes*, Grav., fig. 7; Pinacographia, pp. 17 & 18, pl. xi.

Glypta and *Clistopyga*. The like treatment; *G. mensurator* and *incisa* from resinous tumours inhabited by *Retinia resinella*; *G. pedata*, Desv., from *Teras plumbatana*. *G. rostrata*, Holm., fig. 1, *elegans*, Voll., fig. 2, *flavo-lineata*, Gr., fig. 3, *ceratites*, Gr., fig. 4, *fronticornis*, Gr., fig. 5, *bifoveolata*, Gr., fig. 6; *C. rufator*, Holm., fig. 7, *incitator*, F., fig. 8. *Id. l. c.* pp. 20-22, pl. xiii.

Arenetra, *Lampronota*, and *Meniscus*. The like treatment; *Chalino-cerus longicornis*, Ratz., = *C. defectivus*, Gr., = *Lampronota nigra*, Gr.; *A. pilosella*, Gr., fig. 1, *L. nigra*, Gr., fig. 2, *marginator*, Schiödte, fig. 3, *caligata*, Gr., fig. 4, *M. setosus*, Frer., fig. 5, *catenator*, Pz., fig. 6, *pimplator*, Zett., fig. 7, *agnatus*, Gr., fig. 8. *Id. l. c.* pp. 22 & 23, pl. xiv.

Metopius. The like treatment; the hinder tibiæ are two-spurred, not uni-calcarate, as Holmgren says. *M. fuscipennis*, Wesm., fig. 1, *dissectorius*, Pz., fig. 2, *necatorius*, F., figs. 3 & 4, *anxius*, Wesm., fig. 5, *dentatus*, F., fig. 6, *nasutus*, Gir., fig. 7, pl. xvi., *peltator*, Marshall, pl. xvii. fig. 1. *Id. l. c.* pp. 25 & 26.

Colpomeria, *Lycorina*, and *Pimpla*. The like treatment; *Scambus*, Htg., ? = *Colpomeria*; *C. lacrigata*, Holm., fig. 1, *L. triangulifera*, Holm. (reared from *Gelechia populella*), figs. 2 & 3, *P. melanopyga*, F., var., fig. 4, *roborator*, F., fig. 5, *ovivora*, Boh., fig. 6, *oculatoria*, F., fig. 7, *nucum*, Ratz., fig. 9. *Id. l. c.* pp. 33 & 34, pl. xxi.

Pimpla. A larva apparently feeding only on the substance of a gall of *Nematus viminalis*; P. Cameron, Ent. M. M. xiii. p. 200.

Polysphincta boops, Tschek, reared from a spider (*Theridium*); Brischke, Deutsche E. Z. 1877, p. 285.

Echthrus armatus, Grav., is ♂ of *Phygadeuon semi-orbitatus*, Grav. (*Cryptides*), and should be referred probably to *Xylophrurus*, Först.; *id. l. c.* p. 287.

New genera and species :—

Dolichomitus, F. Smith, P. Z. S. 1877, p. 411. Allied to *Ephialtes* and *Rhyssa*, but its falcate and compressed abdomen removes it from the former, and the incised and tuberculate segments from the latter. *D. longicauda*, p. 412, pl. xlv. figs. 2 & 2a, Bogota.

Perissocerus, id. l. c. p. 412. Closely allied to *Xylonomus*, but with antennæ plumose for half their length and geniculate at the ending of the pubescent portion. *P. plumicornis*, ibid. pl. xlv. figs. 3 & 3a, Amazon Valley.

Aphanoroptra, Thomson, l. c. p. 736. Allied to *Orthopelma*, but suggestive of *Tryphon* in the last ventral segment and petiole. For *Pimpla ruficornis*, Grav.

Troctocerus, F. W. Woldstedt, Bull. Pétersb. xxii. p. 396. For *T. elegans*, ibid., Silesia.

Pachymerus trichophthalmus and *puncticeps*, Thomson, l. c. p. 734, Sweden.

Ephialtes scutellaris, p. 738, (? *crassiceps* and) *gnathaulax*, p. 739, *luteipes* and *abbreviatus*, p. 740, *planifrons* and *antefurcalis*, p. 741, *crassiseta*, p. 743, *pleuralis*, p. 744, id. l. c., various Swedish localities.

Pimpla longiceps, p. 746, *strigipleuris* and *flavicoxis*, p. 747, *tricincta* and *ovalis*, p. 748, *quadridentata*, p. 749, *levifrons*, p. 750, *parallela*, p. 752, *nigricans*, p. 754, *stenostigma* and *nigriscaposa*, p. 755, *punctiventris*, p. 756, *pictifrons*, p. 757, id. l. c., various Swedish localities; *P. caligata*, Vollenhoven, l. c. p. 34, pl. xxi. fig. 8, Schevening.

Polysphincta taschenbergi, Woldstedt, l. c. p. 396, Silesia; *P. pulchrator*, Thomson, l. c. p. 757, Scania.

Lissonota genalis and *subfumata*, p. 760, *hians*, *rimator* (and ? *sulphurifera*), p. 762, *antennalis*, p. 765, *tenerrima*, p. 766, *carinifrons* and *varicoxa*, p. 768, *punctiventris* and *clypealis*, p. 769, *gracilipes*, p. 770, *humirella* and *folii* (parasitic on *Cynips quercus-folii*), p. 771, and *crassipes*, p. 772, Thomson, l. c., various Swedish localities.

Phytodiatius continuus and *rubricosus*, p. 773, *crassitarsis* and *geniculatus*, p. 774, id. l. c., Scania.

Xylonomus glyptus, id. l. c. p. 776, Oland.

Odontomerus pinetorum, *punctulatus*, and *quercinus*, id. l. c. p. 777, Scandinavia; *O. canadensis*, Provancher, Nat. Canad. ix. p. 16, Canada; *O. glandarius*, C. Rondani, Bull. Ent. Ital. ix. p. 189, from larvæ of *Balaninus glandium*.

BRACONIDÆ.

Alysia, Latr., and *Chasmodon*, Hal. General observations and figures of *C. apterum*, Nees, fig. 1, *A. manducator*, Pz., figs. 2 & 3, *rufidens*, Nees, fig. 4, *ruficeps*, Nees, fig. 5, *testacea*, Nees, fig. 6, *contracta*, Hal., fig. 7, *fuscipennis*, Hal., fig. 8; S. C. Snellen von Vollenhoven, Pinacographia, pp. 23 & 24, pl. xv.

Iphaulax and *Bracon*. The like treatment; *I. impostor*, Scop., fig. 1, *B. nominator*, F., fig. 2, *appellator*, Nees, fig. 3, *nigripedator*, Nees, fig. 4,

urinator, F., fig. 5, *picticornis*, Wesm., fig. 6, *bisignatus*, Wesm., fig. 7, *costmali*, Wesm., fig. 8, figured. *Id.* l. c. pp. 37 & 38, pl. xxiv.

Bracon dispar, Rond., nec Koll., Nees, renamed *kollari*; C. Rondani, Bull. Ent. Ital. ix. p. 167.

Ichneutes reunitor, Nees, var. *brevis*, Wesm., from Hecla Cove, Spitzbergen; T. A. Marshall, Ent. M. M. xiii. p. 242.

Aphidileo (? g. n.), Rondani, l. c. p. 167, for *Aphidius resolutus*, Nees.

Bracon penetrator, sp. n., F. Smith, P. Z. S. 1877, p. 413, pl. xlv. fig. 1, Yokohama (ovipositor over nine times the length of the body).

Microgaster halli, sp. n., A. S. Packard, Jun., Am. Nat. xi. p. 52, note, Polaris Bay (Hall's American Arctic Expedition).

Blacus brachialis, sp. n., Rondani, l. c. p. 167, in larvæ of *Chlorops lineatus*.

EVANIIDÆ.

Fenus. Synoptical table of the European species; H. Tournier, CR. Ent. Belg. xx. pp. vi.-x. (criticism by Tosquinet, l. c. p. v.). *F. esenbecki* and *dorsalis*, Westw., = *rubricans*, Guér. Extensions of localities; A. Costa, l. c. p. xxi.

Fenus goberti, Mt. de Marsan, *pedemontanus*, Aosta, p. vii., *terrestris* and *opacus*, Peney, *laticeps*, Italy, *granulithorax*, Switzerland and Bordeaux, p. viii., *nigripes*, *freyi*, *minutus*, p. 9, Switzerland, &c., Tournier, l. c.; *F. vagepunctatus*, A. Costa, l. c. p. xxi. Calabria: spp. nn.

CHALCIDIDÆ.

General observations on the *Chalcididae*, their economy and functions; Otto Stoll, MT. schw. ent. Ges. v. pp. 277-285.

Haltichella myrmeleonis, Fairm., 1875, = *H. graffii*, Ratz., 1844; É. André, Bull. Soc. Ent. Fr. (5) vii. p. cxix.

Cirrospilus (? *lamius*, Walk.). Pupation described, the larvæ disposing themselves like the spokes of a wheel; P. Cameron, P. N. H. Soc. Glasg. iii. p. 99.

Palmon pachymerus, Walk. Transformations described and figured (parasitic on eggs of *Mantis religiosa*); É. André, Feuil. Nat. vii. pp. 136-138, pl. iv. Cf. also M. Girard & Xamheu, Bull. Soc. Ent. Fr. (5) vii. p. lxix.

Olinx. Observations on the structure and affinities of this genus, with description of six species (four new), and suggestions of synonymy; G. Mayr, Verh. z.-b. Wien, xxvii. pp. 155-164.

New genera and species :—

Flabrinus (? g. n.), C. Rondani, Bull. Ent. Ital. ix. p. 180, = *Mymar*, Hal., pt.; for *F. fabarius*, Rond.

Heptocondyla (? g. n.), *id.* l. c. p. 182, for *Pteromalus unicolor*, Koll.

Heptomerus (? g. n.), *id.* *ibid.*, for *C. cæruleo-nitens* and *viridulus* (? spp. nn.).

Macrostigma, id. l. c. p. 184, for *M. aphidum*, ibid., pl. i. figs. 34 & 36, bred from *Hyalopterus pruni*.

Meroligon, id. l. c. p. 185, for *Encyrtus ultor*, Rond.

Misocoris (? g. n.), id. l. c. p. 187, for *Pteromalus oomyzus* and *ovivorus*, Rnd., and *M. oophagus*, ibid., from eggs of *Eurydema oleraceum*.

Myiomisa (? g. n.), id. l. c. p. 189, for *M. microscopica*, sp. n., ibid., pl. ii. figs. 44-46, in larvæ of *Cecidomyia sonchi*, Bremi.

Oomyzus (? g. n.; referred to Bull. Comizio Agrario Parmense, 1870, but here characterized), id. l. c. p. 190, for *O. galeruca*, Fonsc.

Selitrichus (? g. n.), id. l. c. p. 196, for *Encyrtus ceuthorrhynchi*, Rnd.

Tomoligon, id. l. c. p. 200, for *T. cicerinum*, Rnd.

Trogocarpus, id. l. c. p. 204, for *Torymus ballestrerii*, Rnd.

Chrysolampus citrilibius, id. l. c. p. 170, pl. iv. figs. 132-137, in larvæ of *Phytomyza flava*.

Elachistus phytomyzæ, id. l. c. p. 173, figs. 143-146, in larva of *P. affinis*.

Eupelmus circinantis, id. l. c. p. 178, fig. 150, in galls of *Cecidomyia circinans*.

Ormyrus æncicinctus, id. l. c. p. 192, in galls of *Cynips conglomeratus*.

Torymus impar, id. l. c. p. 201, larvæ of *Cecidomyia rosariæ*.

Monodontomerus nubecula, id. l. c. p. 188, pl. iv. fig. 151, on *Cryptus xylocopæ*, Rnd.

Omphale (?) *viticola*, id. Bull. Comizio Agrario Parmense, 1876, and Bull. Ent. Ital. ix. p. 190, pl. iv. figs. 153-155, parasitic in *Antispila rivillii*, Stainton [renamed *rivillellæ* by Rondani, but without any given reason.] This is an *Entedon*; id. Bull. Ent. Ital. ix. p. 290, pl. v. figs. 11-13.

Entedon antispilæ, p. 290, figs. 14-16, *rivillellæ*, p. 291, fig. 17, spp. nn., id. l. c. pl. v. parasitic on *Antispila rivillii*, Stainton.

Encyrtus triozeæ, E. André, Bull. Soc. Ent. Fr. (5) vii. p. cxix., from pupæ of *Trioxa centranthi*, Vall., Beaune.

Oline trilineata, p. 158, *pulchra*, p. 160, *lineaticeps*, p. 162, *obscuripes*, p. 163, Mayr, l. c. Austria (from galls of *Cynipidæ*).

PROCTOTRYPIDÆ.

S. C. Snellen van Vollenhoven, Pinacographia, pp. 28-31, in addition to some general observations, describes and figures typical specimens of *Codrus albipennis*, Thoms., = *apterogynus*, Hal. (emend. *apterogyne*), pl. xviii. figs. 1 & 2, *Proctotrypes gravitator*, L., Nees, fig. 3, *campanulator*, Spin., Nees, fig. 4, *brevipennis*, Latr., Nees, fig. 5, and *emarciator*, F., Nees, fig. 6, also *P. gladiator*, Hal., fig. 7, *longitarsus*, Thoms., fig. 8, and *basalis*, Thoms., fig. 9; *P. pallipes*, Jur., Nees, pl. xix. fig. 1, *crenicornis*, Nees, fig. 2, *areolator*, Hal., fig. 3, *ater*, Nees, fig. 4, *ater*, Thoms., fig. 5, *claripes*, Thoms., fig. 6, *riator*, Hal., fig. 7, *pallipes*, Jur., Hal., fig. 8, *ligatus*, Nees, fig. 9, and *calcar*, Hal., fig. 10. Of these, *brevipennis*, Latr., and *campanulator*, F., are referred to *gravitator*, L.; *brevipennis*, Thoms., *gladiator* and *bicolor*, Hal., to *emarciator*, F.; *P. basalis*, Thoms., ? = *areolator*, Hal., ♂.

Oxytaxis, Först. (*Lyteba*, Thoms.), *Belyta*, and *Ismarus*. The like treatment; *O. erythropygæ*, Först., *B. brachyptera*, Thoms., *sanguinolenta*, Nees, fig. 3, *brachyura*, Thoms., fig. 4, *longipennis*, Thoms., fig. 5, *fuscicornis*, Nees, fig. 6, *subaptera*, Thoms., fig. 7, *I. neesi*, Först., fig. 8, *dorsiger*, Curtis, fig. 9; *id. l. c.* pp. 38 & 39, pl. xxv.

Mymar duisburgi, sp. n., J. P. E. F. Stein, MT. Münch. ent. Ver. i. p. 30, in amber, Ostseestrände (see Duisburg, Schr. Ges. Königsb. ix. 1868, pp. 23-28, pl.).

CYNIPIDÆ.

ADLER. — Beiträge zur Naturgeschichte der Cynipiden. Deutsche E. Z. 1877, pp. 209-248.

Biological observations on, 1, Parthenogenesis in *Rhodites rosæ*; 2, Alternation in generation of Cynipidæ; A, in *Neuroterus*, resulting in *Spathogaster albipes* being bred from eggs laid by *N. fumipennis*, *Neuroterus lenticularis* from galls of *Spathogaster baccarum*, and *Neuroterus numismatis* from galls of *Spathogaster vesicatrix*; B, in *Dryophanta*, resulting in *D. scutellaris* and *Trigonaspis crustalis* being respectively the winter and summer forms of the same species, and in probably a similar alliance between *Dryophanta longiventris* and *Spathogaster taschenbergi*; C, in *Aphilothrix*, resulting in *Aphilothrix radialis* being bred from galls of *Andricus noduli*, and in the probability of a similar connection between *Aphilothrix sieboldi* and *Andricus testaceipes*. The identity of *Aphilothrix corticis*, L., and *rhizomæ* [-*matis*], Htg., is also averred. This paper is also recorded in Pet. Nouv. ii. p. 142, by Lichtenstein; and in Bull. Soc. Ent. Fr. (5) vii. p. xc.; also in Ent. M. M. xiv. p. 44, Verh. z.-b. Wien, xxvii. SB. p. 20, and Ent. Nachr. iii. p. 151. It is commented upon, and taken as corroborating the former experiences of H. F. Bassett with regard to agamous reproduction in *Cynips quercus-operator* and *C. q.-batatus* (?), which were followed in the next generation by a brood composed entirely of females; H. F. Bassett, Canad. Ent. ix. p. 121. P. Cameron, Scot. Nat. iv. pp. 152-157, discussing the question of alternation of generation (nearly the same as Walsh's "Dimorphism"), considers it clear that Adler's hypothesis is erroneous and not consistent with fact. The rareness of the ♂ in various species is again mentioned (with instances of similar rarity of the ♂ in *Tenthredinidæ*).

— . Lege-Apparat und Eierlegen der Gallwespen. *Tom. cit.* pp. 305-332, pl. ii.

An elaborate discussion of the analogies, structure (muscular, &c.), and functions of the ovipositor in the Cynipidæ.

C. G. THOMSON, Opusc. Ent. (fasc. viii.) pp. 778-820, characterizes the Swedish species, adopting 4 tribes for the whole family, *Cynipina*, *Allo-triina*, *Figitina*, and *Ibaliina*. The *Cynipina* include *Cynips* (in which *Biorrhiza*, *Teras*, and many other genera are sunk), *Rhodites*, *Aulax* (including *Sapholytus*, &c.), and *Synergus*.

Observations on various Scotch species; P. Cameron, Ent. M. M. xiii. pp. 199 & 200.

Oak-galls. E. A. Fitch continues his translation from Mayr; Ent. x. pp. 67, 86, 121, 160, 172, 206, 234, 249, & 297, *et seqq.*, figs. 62-76 (in each case adding notes of his own).

A list of gall-producers observed in Great Britain since Müller's list in Ent. Ann. 1872; *id. l. c.* p. 27.

Turkey-oak gall (*Quercus cerris*) near London, dubiously referred to *Spathogaster taschenbergi*, Schlect.; E. A. Ormerod, Ent. x. p. 43, fig. Note by Fitch, *ibid.*

Cynips kollari. 33 Parasites (*Synergus*, *Callinome*, and *Eurytoma*) reared from part of a double gall; Fitch, *l. c.* p. 44.

Isocolus scabiosæ in England, and its gall figured; *id. l. c.* p. 124.

Aphilothrix corticis in England, and its gall figured; Ormerod, *l. c.* p. 165.

Aphilothrix radialis, F. Detailed account and figures of the anatomy of its ovipositor; M. W. Beijerinck, Tijdschr. Ent. xx. pp. 186-198, pls. xi. & xii.

Auloxysta, subg. n. of *Allotria*, having the mesosternum and mesonotum sulcate, and scutellum with a double basal fovea; Thomson, *l. c.* p. 811. For *Allotria piciceps*, Thoms., and *Auloxysta rufa*, *pubicollis*, and *abbreviata*, p. 812, *fuscicornis* and *nigripes*, p. 813, spp. nn., *id. l. c.*, various Swedish localities.

Glyptoxysta, subg. n. of *Allotria*, apparently differing only in having the mesonotum with one furrow instead of none; *id. l. c.* p. 811. For *Allotria xanthocephala*, Thoms., and *G. heterocera*, sp. n., *id. l. c.* p. 814, Scania.

Cynips rufiventris, p. 783 *C. (Andricus) rubripes*, p. 787, and *C. brachycentra*, p. 788, *id. l. c.*, Sweden; *C. bombycida*, O. Rondani, Bull. Ent. Ital. ix. p. 172, bred from pupa of *Saturnia pyri*: spp. nn.

Aulax pilicornis and *abdominalis*, p. 801, *foveiger*, *tragopoginis*, and *crassinervis*, p. 803, *A. (Xenophanes) foveicollis*, p. 804, *A. (X.) abbreviatus* and *brevitarsis*, p. 805, *A. rugiscuta*, p. 806, *luteipes* and *punctipleuris*, p. 807, *valerianellæ*, p. 810, spp. nn., Thomson, *l. c.*, various Swedish localities.

Andricus cocciferæ and *ilicis*, spp. nn. (mere indications), J. Lichtenstein, Bull. Soc. Ent. Fr. (5) vii. p. cii., galls on oaks, Montpellier.

Rhodites mayri, sp. n., G. v. Schlechtendal, J.B. Ver. Zwickau, 1876, p. 59, Germany.

Allotria macrocera, sp. n., Thomson, *l. c.* p. 814, Scania.

Amblynotus heterocerus, sp. n., *id. l. c.* p. 815, Lund.

Sarothrus brevicornis, sp. n., *id. ibid.*, Scania.

Homalaspis ruficornis, sp. n., *id. l. c.* p. 816, Lund.

Clidotoma erythropus, *ibid.*, *dolichocera*, p. 817, spp. nn., *id. l. c.*, Lund.

Cothonaspis ovalis, sp. n., *id. l. c.* p. 817, Sweden.

Glauraspidia sericea, p. 818, *parva*, p. 819, spp. nn., *id. l. c.*, Sweden.

Eucæla erythroceræ, sp. n., *id. l. c.* p. 819, Stockholm.

TENTHREDINIDÆ.

Observations on species of various genera in the Stephensian collection, with their synonymy; indications of species new to Britain, notices of economy, &c.; *Nematus pallescens*, Htg., ♂ described from Scotland (p. 177); criticisms on habitats given by Dours in his Cat. Syn. Hym. Fr. (p. 198, note); larvæ of *Tenthredo mesomela*, L., Thoms. (*viridis*, Kl.), and of *Emphytus calceatus*, Kl., described, p. 199. P. Cameron, Ent. M. M. xiii. pp. 173-178, 196-199.

Tenthredinidæ at Braemar; *id.*, Scot. Nat. iv. p. 13.

References to British gall-producers recorded since Müller's list in Ent. Ann. 1872; E. A. Fitch, Ent. x. p. 28.

Trichiosoma. Larvæ of four British species described; Cameron, P. N. H. Soc. Glasg. iii. pp. 204-207.

Pachyprotasis rapæ, L., *Athalia spinarum*, Fab. (var. n. *orientalis*, p. 90), *Hyiotoma pagana*, Pz., and *Lophyrus pini*, L., from the East Indies; *id.* Tr. E. Soc. 1877, pp. 38-91.

Nematus lugdunensis, Vollenh., = *vesicator*, Bremi, and a confusion in Vollenhoven's treatment of this and allied species pointed out; Kriechbaumer, Ent. Nachr. iii. p. 20, note. J. W. May, Ent. x. p. 275, translates Vollenhoven's description.

Phyllotoma aceris, injuring trees near Brussels; R. McLachlan, P. E. Soc. 1877, p. xvii.

Athalia. Notes on the Old World species; Hartig's location of it between *Selandria* and *Allantus* preferred. *A. hematopus*, Klug, aids the fertilization of orchids in S. Africa. Cameron, P. N. H. Soc. Glasg. iii. pp. 128-132.

Blennocampa. Notes on the British species, including descriptions of *B. subcana*, Zadd., and *micans*, Kl., new to the fauna; *id.* Ent. M. M. xiv. pp. 56-58; *id.* P. N. H. Soc. Glasg. iii. pp. 108-110, 207.

Taxonus agilis, Klug. Larva described, from *Arundo phragmites*; A. Laboulbène, Bull. Soc. Ent. Fr. (5) vii. p. cxxx.

Tenthredo velox, F., var. n. *nigro-lineata*, P. Cameron, Scot. Nat. iv. p. 11, Braemar.

Senoclia, g. n., for *Anisoarthra*, Cameron, nec Waterh., nec Dej.; P. Cameron, Tr. E. Soc. 1877, p. 88, note; *A. cyanella* is from New Guinea, not Ceylon.

Beleses, g. n., for *Anisoneura*, Cameron, nec Liroy, *id.* *ibid.*; *B. fulvus*, sp. n., *id.* l. c. p. 88, Western Yunnan.

Siobla, g. n., *id.* *ibid.* Neuration of *Tenthredo*, but with the lanceolate cellule of *Emphytus*, and clypeus much smaller and truncated at apex. For *Tenthredo incerta*, Cam., ? *Macrophya sturmi*, Klug, and *S. mooriana*, sp. n., *id.* l. c. p. 89, W. Yunnan.

Ancyloneura, g. n., *id.* l. c. p. 91. *Lophyrines*: allied to *Lophyrus* and *Brachytoma*, but with appendicular cellule in posterior wings. *A. varipes*, sp. n., *id.* l. c. p. 92, Aru.

Hyilotoma excisa, Penang, and *bipunctata*, India, p. 90, *interstitialis*, Darjeeling, and *simlaensis* [sic], Simla, p. 91, spp. nn., *id.* l. c.

Nematus anglicus, id. Ent. M. M. xiii. p. 173, England, *antennatus*, id. *op. cit.* xiv. p. 58, Scotland, spp. nn.

Blennocampa alchemilla, sp. n., id. P. N. H. Soc. Glasg. iii. p. 107, Scotland.

Hoplocampa gallicola, sp. n., id. Ent. M. M. xiv. p. 156, S. England.

Dineura simulans, sp. n., id. l. c. p. 155, England.

Allantus unifasciatus, sp. n., A. Mocsáry, Term. füzetek, 1877, p. 87, Hungary.

Macrophya ezimias, sp. n., id. l. c. p. 87, Buda.

Tenthredo latifasciata and *simulans*, spp. nn., Cameron, Tr. E. Soc. 1877, p. 87, India.

Dolerus chappelli, sp. n., id. Ent. M. M. xiv. p. 155, England.

Tarpa speciosa, sp. n., Mocsáry, l. c. p. 88, Bosnia.

LEPIDOPTERA.

BY

W. F. KIRBY, M.E.S., &c.

GENERAL NOTES.

Part c. of W. C. Hewitson's "Exotic Butterflies," completing the work, part vii. of his "Illustrations of Diurnal *Lepidoptera*: *Lycenidae*," also part v. of his "Equatorial *Lepidoptera*," and vol. ii. part 6, of W. H. Edwards's "Butterflies of North America," have appeared within the year.

A. G. Butler has published "Illustrations of Typical Specimens of *Lepidoptera Heterocera* in the collection of the British Museum," part 1, 4to, pp. 62, London, 1877, 20 coloured plates. This work contains figures of over 200 species, some new, but the majority previously described by Walker, Butler, and others.

A. Depuiset has published "Les Papillons: Organization, Mœurs, Chasse, Collections, Classification. Iconographie et Histoire Naturelle des Papillons d'Europe. 2^e édition." Paris: 1877, 4to, pp. 326, 50 pls. (1 plain and 49 coloured), and 260 woodcuts. A popular work, uniform with that on *Coleoptera* noticed in Zool. Rec. xiii. *Ins.* p. 10. The plain plate represents entomological apparatus. The woodcuts are of no great merit, and many of them are drawn out of all proportion, by way of representing the perspective of the insects. They illustrate the intro-

ductory portion of the book, and are apparently derived from various sources; many of them represent foreign insects, and others represent species already figured on the plates. The letterpress to the plates is confined to brief notices of the times of appearance and the transformations of the species figured. Plates ii.-xlviii. inclusive are taken from Berge's "Schmetterlingsbuch," but the colouring is in many cases very inferior to that of the original; pls. xlix. & l. contain a few selected species of *Micro-Lepidoptera*.

W. F. Kirby has published a Supplement to his Synonymic Catalogue of Diurnal *Lepidoptera*, comprising additions and corrections from March, 1871, to June, 1877, inclusive (London: 1877, 8vo, pp. vi. 691-883).

W. F. Kirby has commenced a series of Introductory Papers on *Lepidoptera* in the "Entomologist." Those published in 1877 (vol. x.) comprise—"On the Formation of a Collection of Foreign *Lepidoptera*," pp. 108-112; "Localities of *Lepidoptera*," pp. 146-151; *Nymphalidæ*: *Danainæ*, *Satyrinæ*, *Elymniinæ*, and *Morphinæ*, pp. 198-201, 220-225, 241-245, 290-295.

P. Millière has completed the third and last volume of his "Iconographie des Chenilles et Lépidoptères inédits," by publishing livraisons 27-32, comprising pp. 171-488, pls. cxvii.-cliv. As these parts have not also been published in Ann. Soc. Lyon, they have escaped notice in previous Records.

A great number of short notes on the species figured by P. Millière will be found at the end of vol. iii. of his "Icones," pp. 455-467, but they are too numerous, short, and technical to be further noticed here.

S. H. Scudder has published a paper on the "Classification of Butterflies," with special reference to the Equites, or Swallow-tails (Tr. Am. E. Soc. vi. pp. 69-80. He admits only four main families:—

1. The brush-footed butterflies, or Nymphales (*Nymphalidæ*, Bates).
2. The gossamer-winged butterflies, or Rurales (*Erycinidæ* and *Lycanidæ*, Bates).
3. The typical butterflies, or Papilionides (*Papilionidæ*, Bates).
4. The skippers, or *Urbicolæ* (*Hesperidæ*, Bates).

The characters and affinities of the various families and subfamilies are fully discussed, and are illustrated by a phylogenetic diagram.

The geographical distribution of the *Rhopalocera* and *Sphinges* forms an important section of A. R. Wallace's large work on the "Geographical Distribution of Animals."

Note on migrating butterflies; W. H. Edwards & S. H. Scudder, Am. Nat. xi. pp. 244 & 245.

Antigeny, or sexual dimorphism in butterflies, is discussed by Scudder, P. Am. Ac. (2) iv. pp. 150-158.

Remarks on melanism in *Lepidoptera*: S. R. Fetherstonhaugh & W. H. Tugwell, Ent. M. M. xiii. pp. 215, 256 & 257; by F. B. White & W. A. Forbes, *op. cit.* xiv. pp. 15-17; and by N. Cooke and others, Ent. x. pp. 126-132, 151-153.

F. Buchanan White has read a paper on the male genital armature in the European *Rhopalocera*, taking *Epinephele hyperanthus* as a typical

example. There are three appendages, an upper and two lower ones. He calls the former the tegumen, and the latter the harpagones, though possibly equivalent to the appendices inferiores in *Trichoptera*. A brief abstract is given in J. L. S. xiii. p. 195, and the paper will be noticed again when published in its complete form.

A paper by the late D. Bürger on the nervous system of *Lepidoptera* is published by C. A. Hoffmann in Niederl. Arch. Zool. iii. pp. 97-125, pl. vi. He concludes that the chorda supra-spinalis in *Lepidoptera* is directly connected with the external neurileum of the abdominal cord (Bauchmark), of which it is an outgrowth.

Various observations on the senses of *Lepidoptera*, their stridulation, and on the fertilization of flowers by them, may be found in Nature, xv. pp. 254, 473-475; xvi. pp. 265, 266, & 522; xvii. pp. 11, 45, 82, 102, 162, & 163.

Trouvelot and Packard describe various experiments on the antennæ and other senses of *Lepidoptera*, &c., but without being able to form any definite conclusion as to the functions of the antennæ. Am. Nat. xi. pp. 193-196, 418-423. They also state (*l. c.* p. 243) that white and yellow butterflies prefer flowers of their own colour.

On sounds produced by *Lepidoptera*; O. M. Reuter, Ent. Monatsbl. i. p. 53, transl. Ent. M. M. xiii. pp. 229 & 230.

On stridulation in the *Heterocera*; A. H. Swinton, Ent. M. M. xiii. pp. 273-277.

On an organ of hearing in *Lepidoptera*, analogous with one existing in *Acridiula*, &c.; *id. op. cit.* xiv. pp. 121-126.

Monstrosities in *Lepidoptera* noticed by Bertkau, Verh. Ver. Rheinl. xxxiv. p. 32.

Notes on double-brooded *Lepidoptera*; B. Gill, Ent. x. p. 50.

On the hybernation of butterflies; J. Jenner Weir, Ent. x. pp. 190 & 191.

On collecting *Lepidoptera* at night; A. Pagenstecher, JB. Nass. Ver. xxix. & xxx. pp. 40-54. A list of captures is added.

Moth-trap invented by Peyerimhoff described, and list of captures given; Austaut, Pet. Nouv. ii. pp. 99 & 100.

On ticketing collections; A. Constant and others, *op. cit.* pp. 103, 110 & 111, 127, 134 & 135.

Setting-boards; J. S. Johnson, Field and Forest, iii. pp. 83-85.

Notes on the parasitism of certain Lepidopterous insects, J. O. Westwood, Tr. E. Soc. 1877, pp. 433-437. The species noticed are parasitic on *Homoptera* (cf. pl. x.c. figs. 1-3); on larvæ of *Doratifera*; on the three-toed sloth; and on the pupa of a *Tuchina*. Cf. also P. E. Soc. 1877, pp. xviii. & xix.

On an undetermined Lepidopterous larva, supposed by Rennie to be parasitic on living snails; J. W. Douglas, Ent. M. M. xiv. pp. 43 & 44.

A remarkable Lepidopterous gall from South America described; P. Cameron, P. N. H. Soc. Glasg. iii. p. 20.

F. Müller records a small larva keeping company with a large one; it was generally perched on its back, and both fed on mulberry, &c.; Zool. Gart. xviii. p. 67, Nature, xv. p. 264.

O. S. Wilson has commenced a work entitled, "The larvæ of the British *Lepidoptera* and their food-plants, with life-sized figures, drawn and coloured from nature by Eleanora Wilson." (Part i. 1877: London, 8vo, pp. xvii.-xxix. 48, pls. i.-viii.) The work is intended to bring together reliable descriptions of all the known larvæ of British *Lepidoptera*, and a large number are figured. Doubleday's arrangement is followed, and the first part extends from the *Diurni* to the *Procridae*.

A. Weismann has published Part ii. of his "Studien zur Descendenz-Theorie: Über die letzten Ursachen der Transmutationen." Leipzig: 1876, pp. xxii. 336, 5 col. pls. The greater portion of the work is taken up with an investigation of the variation of the larvæ of different species of *Sphingidæ*, undertaken for the purpose of determining whether they are due to the operation of the recognized causes of variation. The various stages of many European larvæ of *Chorocampa*, *Dilephila*, *Smerinthus*, *Macroglossa*, *Pterogon*, *Sphinxæ*, and *Anceryx* are discussed in great detail, and compared with those exotic species of which the larvæ are known. The first result of his inquiries is that the different colours of these larvæ in different stages are really derived from those of the parent species, and are not the result of varying external conditions acting upon the larva at successive stages of its existence. The latter case only happens exceptionally, in the later stages of such species as *Chorocampa elpenor* and *porcellus*, which resemble each other very closely when young. He then lays down the three following laws:—

1. Development begins with the simplest form, and passes gradually into the more complex.

2. New characters first appear in the last stage of Ontogenesis.

3. These characters pass backwards into the earlier stages, and interfere with the former characters till they finally obliterate them. This accounts for the appearance of rudimentary characters in an early stage, which only become fully developed in a later one.

The author next proceeds to consider whether the pattern of larvæ is *ab initio* a purely morphological character, developed by inward impulses, and by a vital principle determining its growth, or whether it is only due to the action of external influences on the organism; and concludes that both factors must be taken into consideration. The larvæ of all *Sphingæ* which are dimorphic or polymorphic in their later stages, possess the same colour when young. The protective significance of the green and brown dimorphism of many larvæ with reference to the habits of the various species which exhibit it, is also fully discussed; and subsequently that of the lines, stripes, and other markings of *Lepidopterous* larvæ in general; and more particularly in *Sphingidæ*. The larvæ of the *Sphingidæ* were originally unicolorous, and first assumed longitudinal dorsal lines, then oblique streaks, and subsequently eye-spots; and alterations in their colour and pattern are originally due exclusively to the recognized factors of natural selection and correlation.

It is subsequently shown that larvæ and perfect insects vary independently of each other, and that in the majority of cases, the structure of the larva has but little connection with that of the perfect insect. These points are also discussed in the most elaborate manner, with the result

that to all appearance the transformations of forms in the organic world are due exclusively to external influences. Some portions of the work do not come within the province of the present Recorder; and the above abstract must be taken merely for a sketch of the most important questions relating to *Lepidoptera* discussed in this comprehensive work. The author's criticisms on classification, and remarks on many other subjects of great interest and importance, cannot be more than thus briefly alluded to here.

J. W. Slater points out that gaily-coloured caterpillars usually feed on poisonous plants, and are probably rejected by birds because they are themselves poisonous. *Tr. E. Soc.* 1877, pp. 205-209; *cf.* also *P. E. Soc.* 1877, pp. xi. & xii.

On the fondness of larvæ for water: C. G. Siewers, *Rep. E. Soc. Ont.* 1877, pp. 17 & 18; *Canad. Ent. ix.* pp. 127-129.

On variation in larvæ; A. R. Grote, *Canad. Ent. ix.* pp. 209 & 210.

Young larvæ (unknown) feeding on haws in October; A. V. Jones, *Ent. M. M. xiv.* p. 158.

On the preservation of Lepidopterous larvæ by inflation; C. H. & H. M. Golding Bird, *Ent. x.* pp. 225-234, with woodcuts of apparatus; *cf.* also G. T. Porritt, *Ent. x.* pp. 258 & 259.

The metamorphoses of *Lepidoptera*, and especially the difficulties connected with the pupa, are discussed in relation to Darwinism by F. G. Schild, *S. E. Z. xxxviii.* pp. 87-97. He regards *Micropteryx*, and not *Psyche*, as coming nearest to the *Phryganeidæ*.

On the mechanical arrangements of pupation; J. A. Osborne, *Nature*, xvi. pp. 502 & 503.

The effect of cold on the pupæ of *Phyciodes tharos*, *Papilio ajax*, and *Lycena pseudargiolus*. Experiments related by W. H. Edwards, *Canad. Ent. ix.* pp. 203-206, tend to show that cold produces suffusion of markings in the perfect insect.

Notes on pupa-digging; A. E. Hunter & H. Benson, *Ent. x.* pp. 259 & 260.

Great Britain.

On collections of British *Lepidoptera*; E. Birchall, *Ent. M. M. xiii.* pp. 279 & 280, and N. T. Dobrée, *op. cit.* xiv. pp. 41 & 42.

New and rare British *Lepidoptera* observed during the years 1874, 1875, & 1876; J. T. Carrington & W. P. Weston, *Ent. x.* pp. 2-9, 31-35, 89-92, 117-120.

Captures in North Wales in October 1876, A. O. Walker, *Ent. M. M. xiii.* p. 211; at the Stack Rocks, by C. G. Barrett, *tom. cit.* pp. 249-251; in the Isle of Man in 1877, by E. Birchall, *op. cit.* xiv. pp. 68 & 69; at Dartmouth, by G. F. Matthew, *tom. cit.* p. 157; in the Norfolk Fens, by W. H. Tugwell, *Ent. x.* pp. 15-19; and at Witherslack, by J. H. Threlfall & J. B. Hodgkinson, *tom. cit.* pp. 21-25; on the South Coast, North Wales, Gateshead, Witherslack, and Sherwood Forest, *tom. cit.* pp. 255-257, near Petersfield, Hants, E. K. Robinson, *tom. cit.* p. 303.

Notes on *Lepidoptera* observed in 1876; T. Wilson, *Ent. M. M. xiii.* pp. 211 & 212. On collecting *Lepidoptera* at light; F. D. Wheeler, *tom.*

cit. pp. 246-248. Captures at sugar in 1876; H. W. Livett, *Ent.* x. pp. 133 & 134.

F. B. White has continued his papers on Scotch *Lepidoptera* from *Fidonia brunneata* to *Thera simulata*; *Scot. Nat.* iv. pp. 31-34, 120-132, 173-175.

Sir T. Moncrieffe has published a list of the *Lepidoptera* of Moncrieffe Hill as far as the end of the *Noctuæ*; *tom. cit.* pp. 38-46, 99-110, 144-152.

Notes on the occurrence of *Lepidoptera* in Northumberland and Durham in 1875; W. Maling, *Tr. North. Durh.* v. pp. 277-282.

Notes on some *Macro-Lepidoptera* occurring on the coast near the mouth of the Tyne; J. C. Wassermann, *tom. cit.* pp. 282-295.

Notes on the *Lepidoptera* of the Scilly Isles; H. H. Crewe, *Ent. M. M.* xiv. pp. 148-150, *Ent. x.* pp. 295-297.

On the variations exhibited by the *Lepidoptera* of Pembrokeshire; C. G. Barrett, *Ent. M. M.* xiii. pp. 201-205.

France.

Captures in France in 1877; E. L. Ragonot, *Bull. Soc. Ent. Fr.* (5) vii. pp. cxxxvii. & cxxxviii., and Fetting, *Pet. Nouv.* ii. p. 191.

Calendar of French larvæ for January and February; De Lafitole, *Pet. Nouv.* ii. p. 122, March, pp. 126 & 127, April, pp. 138 & 139, 142 & 143, May, pp. 154 & 155, 174 & 175.

Notes on larvæ observed feeding in Parisian flower gardens; P. Mabille, *Bull. Soc. Ent. Fr.* (5) vii. pp. clxiii. & clxiv.

Holland and Belgium.

Seven *Micro-Lepidoptera* noticed as new to Holland; F. J. M. Heylaerts, *Tijdschr. Ent.* xx. p. xc.

Notes on *Lepidoptera* captured at Hautes Fagnes; De Selys Longchamps, *Bull. Soc. Ent. Belg.* xx. p. xxxviii.

Germany, &c.

On the *Macro-Lepidoptera* of Bechburg; F. Riegenbach-Stehlin, *MT. schw. ent. Ges.* iv. pp. 597-621. 599 species enumerated.

List of the *Lepidoptera* of Thuringia; F. Knapp, *Z. ges. Naturw.* (3) ii. pp. 133-166.

Notes on the *Macro-Lepidoptera* of Prussia Proper; R. Grentzenberg, *Schr. ges. Königsb.* xvii. pp. 171-175.

F. Sintenis has published a Catalogue of the *Lepidoptera* of Esthonia, Livonia, Curland, and the Oesel, comprising 784 *Macro-* and 974 *Micro-Lepidoptera*; *Arch. Nat. Livl.* (2) vii. pp. viii., 327-386. He also (*SB. Ges. Dorp.* iv.) publishes directions for arranging and completing a collection of *Lepidoptera* (pp. 233-236); a list of captures of *Macro-Lepidoptera* in 1876 (pp. 266-273); and notes on various *Lepidoptera* (pp. 515-524).

Switzerland.

A six weeks' Entomological Tour in Switzerland; J. C. W. Tasker, *Ent. x.* pp. 112-117. Captures in Switzerland; W. A. Forbes, *Ent.*

M. M. xiii. pp. 243-245. In the Upper Engadine ; C. G. Giebel, Z. ges. Naturw. (3) ii. pp. 214 & 215.

On the Lepidopterous Fauna of the Upper Albula ; P. C. Zeller, S. E. Z. xxxviii. pp. 265-322, 427-476. (*Rhopalocera* to *Geometridæ* inclusive). This paper includes a full description of the localities of the neighbourhood, and important observations on habits, transformations, &c.

On the *Lepidoptera* of the Albula Pass, see also H. Frey, MT. schw. ent. Ges. iv. pp. 550-556 ; JB. Ges. Graub. xx. pp. 112-150.

Mann and Rogenhofer have published a list of captures in the Dolomite district, including a few new species ; Verh. z.-b. Wien, xxvii. pp. 491-500.

Italy.

A. Curò has continued his Catalogue of the *Lepidoptera* of Italy ; Bull. Ent. Ital. ix. pp. 3-24, 143-165, 252-288 (including the *Noctuæ* and *Deltoideæ*), and pp. 321-332 (Index).

Spain.

Captures at San Ildefonso ; J. M. de Castellarnau y de Lleopart, An. Soc. Esp. vi. p. 166.

List of *Lepidoptera* taken by T. Seebold at Bilbao, with descriptions of new species, &c. ; A. Rössler, S. E. Z. xxxviii. pp. 359-380.

Africa.

Notes on various Algerian *Lepidoptera* ; O. Staudinger, Pet. Nouv. ii. p. 190.

J. Mansel Weale publishes an important paper on the variation of *Rhopaloceros* forms in South Africa. After noticing the characteristics of the region, he remarks on the variation, transformations, and especially the variation of the pupæ in the following species : *Papilio merope*, Cram., *Acræa esebria*, Hew., *Junonia pelargis*, archesia, and *amestris* (probably forms of one species), *Anthocharis evarne*, Klug, and *keishamma*, Trim. (also doubtless varieties), and several other butterflies, which are noticed in less detail. Tr. E. Soc. 1877, pp. 265-275.

Habits of Zanzibar butterflies ; Buxton, Ent. M. M. xiv. pp. 153 & 154.

P. Mabille has published a catalogue of the (diurnal) *Lepidoptera* of the West Coast of Africa, chiefly of the Congo, including descriptions of a few new species, and prefaced by general remarks on the character of the African fauna : Bull. Soc. Zool. Fr. 1876, pp. 194-203, 274-281 ; 1877, pp. 214-240.

Western Asia.

Additions to the Lepidopterous fauna of Transcaucasia ; H. Lang, Hor. Ent. Ross. xii. pp. 153-157.

H. Christoph publishes a list of captures in North Persia, Krasnovodsk in Turcomania, and Daghestan, and describes and figures about sixty new species ; tom. cit. pp. 181-299, pls. v.-viii.

Indian Region.

F. Moore gives a list of 274 *Lepidoptera* (104 *Rhopalocera* and 170 *Heterocera*) occurring in the Andaman and Nicobar Islands, with descriptions and figures of many new species, and a table of geographical distribution; P. Z. S. 1877, pp. 580-632, pls. lviii.-lx.

A brief preliminary notice of 280 *Lepidoptera* (43 new, named but not diagnosed), collected by Captain Pinwill in Malacca, with notes on their geographical relations; A. G. Butler, J. L. S. xiii. pp. 196 & 197.

M. C. Piepers' paper on the habits of East Indian *Lepidoptera*, &c. [cf. Zool. Rec. xiii. Ins. p. 145], is translated by W. F. Kirby, Ent. x. pp. 266-275.

P. C. T. Snellen has published a list of 139 *Lepidoptera Heterocera* collected by M. C. Piepers in Java, with description and figures of many new species and larvæ; Tijdschr. Ent. xx. pp. 1-50, pls. i.-iii.

P. C. T. Snellen gives a list of the *Lepidoptera* collected by Captain Korndörffer in Sumatra, especially in Atchin, and describes and figures several new moths; Tijdschr. Ent. xx. pp. 65-79, pls. v. & vi.

List of 86 *Rhopalocera* from the Chekiang and Kiangsu Provinces, China; W. B. Pryer, Ent. M. M. xiv. pp. 52-55.

A. G. Butler has published a list of 50 *Lepidoptera* collected by H. E. Hobson in Northern Formosa, including 6 new species; P. Z. S. 1877, pp. 810-816.

A. G. Butler (Ann. N. H. 4, xix. pp. 92-95) remarks on the following known Japanese species of butterflies:—*Neptis ludmilla*, Herr. Schöff., new to Japan; *Argynnis nerippe*, Feld., var., *Colias paleno*, Linn., *Thecla japonica*, Murr., is distinct from *smaragdina*, Hew.; *Lethe diana*, Butl., is quite distinct from *marginalis*, Motsch., which is probably a *Mycalesis*, and *L. whitleyi* is distinct from *L. maacki*; *Pronophila schrencki*, Mén., is a *Lethe*; *Argynnis ella*, Brem., = *anadyomene*, Feld.; *A. daphnis*, Motsch., probably = *A. nerippe*; *A. adippe* is not Japanese; *Araschnia burejana* is probably distinct from *strigosa*; *Neope segonax*, Hew., from Shanghai, is probably distinct from *N. muirheadi*, and *Pararge deidamia*, Eversm., = *menetriesi*, ♂.

Australian Region.

J. Kirsch has published an important paper on the *Lepidoptera* of New Guinea, collected by Dr. Meyer; MT. Mus. Dresd. i. pp. 103-134, pls. v.-vii. He enumerates 167 species, many of which are new. The introductory remarks on collecting, distribution, &c., by Dr. Meyer will be read with interest. The new species and most important notes on known species will be noticed *infra*.

The transformations, eggs, &c., of various New Zealand *Lepidoptera* are described by F. W. Hutton, Tr. N. Z. Inst. ix. pp. 355-358.

A. G. Butler has published a list of 140 species of *Lepidoptera Heterocera* contained in two collections from New Zealand, with descriptions of new genera and species, and many corrections of synonymy; P. Z. S. 1877, pp. 379-407, pls. xlii. & xliii. He also (*l. c.* pp. 466-475) publishes

a list of 50 species of *Lepidoptera* contained in a collection received from Cape York and the south-east coast of New Guinea, and describes 9 species as new.

A. G. Butler enumerates 36 *Lepidoptera* collected by T. J. Whitmee at Lifu (Loyalty Group), and describes some new species; *Ann. N. H.* (4) xx. pp. 348-359.

On a collection of *Lepidoptera* made by the Rev. G. Brown on Duke of York Island and its neighbourhood; *Salvin & Godman, P. Z. S.* 1877, pp. 139-151, pls. xxii. & xxiii. 40 *Rhopalocera*, 14 *Heterocera*, many new.

List of 17 *Lepidoptera* (some new) captured by T. Blackburn in the Hawaiian Islands; A. G. Butler, *Ent. M. M.* xiv. pp. 47-50.

North America.

W. H. Edwards has published a catalogue of the *Lepidoptera* of America north of Mexico; pt. i., *Diurnals*, 8vo, pp. 68, Philadelphia, 1877 (*Tr. Am. E. Soc.* vi. pp. 1-68). He admits 506 species; the numerous corrections of synonymy cannot be here specified.

The butterfly fauna of Eastern North America compared with that of Europe, exclusive of the Mediterranean Region; S. H. Scudder, *P. Am. Ass.* xxv. pp. 268-273. He points out their resemblances and differences, and concludes that the former exhibits a preponderatingly southern origin.

The following destructive North American *Lepidoptera* are noticed and figured in various stages by B. Gott, *Rep. E. Soc. Ont.* pp. 41-46: *Clisiocampa americana*, *Ægeria tipuliformis*, *Pempelia grossulariæ*, *Carpocapsa pomonella*, and *Arctia isabella*.

List of a collection of Canadian moths labelled by F. Walker, with notes on the identification of the species; A. R. Grote, *Canad. Ent.* ix. pp. 27-29.

Captures near Lake Erie; *id. l. c.* p. 120.

List of *Bombyces* occurring on the Island of Montreal; F. B. Caulfield & C. W. Pearson, *tom. cit.* pp. 90-92.

List of *Lepidoptera* (*Rhopalocera* to *Notodontidae*) occurring at Center, N. Y.; J. S. Bailey, *tom. cit.* pp. 115-119.

H. Edwards publishes notes on various Californian *Lepidoptera*, with descriptions of a few new species and varieties; *P. Cal. Ac.* vi.

West Indies.

A list of the *Lepidoptera* collected in Porto Rico by Consul Krug, including observations, and descriptions of a few new species, is published by H. Dewitz, *S. E. Z.* xxxviii. pp. 233-245, pl. i. (Butterflies), and *MT. Münch. ent. Ver.* i. pp. 91-96 (Moths).

South America.

H. B. Möschler has published a second series of observations on the *Lepidoptera* of Surinam, in which he discusses the *Sesiidae*, *Syntomidae*, and *Bombyces* generally, noticing generic characters, and corrections of syno-

nymy, &c., and describing and figuring many new species; Verh. z.-b. Wien, xxvii. pp. 629-700, pls. viii.-x.

A. G. Butler publishes a list of the *Lepidoptera* collected by J. W. H. Trail on the Amazons, from 1873 to 1875, with dates, localities, and descriptions of new species; Tr. E. Soc. 1877, pp. 105-156, pl. iii. [274 species enumerated]. He also publishes a list of 69 *Lepidoptera*, chiefly butterflies, collected by W. Davis in Peru, and describes a new genus and a few new species; Ann. N. H. (4) xx. pp. 117-129.

E. C. Reed has published a monograph of Chilian Butterflies (Una Monografía de las Mariposas Chilenas; 8vo, pp. 93, pls. iii. Santiago de Chile: 1877). He describes 66 species, some new, whereas others are indicated as probable synonyms.

Notes on the *Lepidoptera* of Patagonia; C. Berg, Bull. Mosc. lii. pp. 1-22, An. Soc. Argent. iv. pp. 87-102, 199-201. These papers are to a considerable extent a repetition of each other, and also contain the substance of a work on the same subject, by the same author, which the Recorder has not seen.

PAPILIONIDÆ.

Ornithoptera. On the mode of suspension of the pupa; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. pp. lxxxiii. & lxxxiv. *O. aruana*, Feld., and *urviliana*, Guér., noticed by Salvin & Godman from Duke of York Island; P. Z. S. 1877, p. 147. *O. pegasus*, Feld., redescribed, and two varieties of the ♀ figured by J. Kirsch, MT. Mus. Dresd. i. pp. 110-112, pl. v.

Papilio. W. H. Edwards (Butt. N. Amer. ii.) figures *P. asterias*, hermaphrodite (fig. 1), and var. *calverleyi* (figs. 2-5), *Pap.* pl. ii.; and also different varieties of *P. turnus*, and the black form *glaucus* (*Pap.* pls. iii.-v.), adding remarks on melanism. *P. philenor* and *glaucus*: alleged appendages on the eye, E. M. Aaron, Canad. Ent. ix. p. 200; supposed to be pollen, A. R. Grote, *tom. cit.* p. 220. *P. leodamas*, *ormenus*, *euchenor*, *telegonus*, &c., from New Guinea, noticed by J. Kirsch, *l. c.* pp. 112 & 113. *P. agamemnon* and *polydorus*, Linn., varr., from Duke of York Island, noticed by Salvin & Godman, P. Z. S. 1877, pp. 148 & 149. *P. archidamas*, Boisd., transformations described; G. F. Mathew, Ent. M. M. xiv. pp. 152 & 153. *P. xynias*, fig. 48, and *mangoura*, figs. 49 & 50, W. C. Hewitson, are figured by him, Ex. Butt. v. *Pap.* pl. xv. *P. bimaculatus*, Hew., = *P. timias*, Gray [misprinted *xynias*, teste W. C. H.], *id. l. c.* corrections. *P. aristolochiæ*, var. *camorta*, from the Nicobars, described by F. Moore, P. Z. S. 1877, p. 592. *P. hippocosa*, Fabr.: P. Mabille doubts its being the female of *merope*, Cram.; Bull. Soc. Zool. Fr. 1877, pp. 227-229. *P. podalirius*: on breeding; "P. G.," Pet. Nouv. ii. pp. 98 & 99. *P. æthus* and *æthulus* are broods of the same species; F. M. Jonas, Ent. x. p. 97.

Thais polyxena, W. V., var. *polymnia*, from Naples and Eubœa, described and figured by P. Millière, *l. c.* iii. pp. 438 & 439, pl. cliv. fig. 2. *T. rumina* (doubtless introduced with vegetables) taken in Brighton market; H. Goss, Ent. M. M. xiv. p. 137.

Parnassius. Observations on the known species and their varieties,

with analytical table: *P. nomion*, F. v. W., varr. nn. *venusi* and *virgo*, East Siberia (p. 418); L. W. Schaufuss, Nunq. Ot. ii. pp. 417-422. *P. apollo*, Linn., and *delius*, Esp.: P. C. Zeller remarks on the pairing of the former species, and describes the larva of the latter; S. E. Z. xxxviii. pp. 278-280. *P. delius*: the wings of a specimen which was being denuded of its scales, split horizontally into two equal halves; V. Kolb, MT. Münch. Ver. i. pp. xiii.-xvi. *P. clarius* of American authors = *clodius*, Mén. var., and another var. from Western North America is described as *P. menetriesii*; H. Edwards, P. Cal. Ac. vi.

Ismene helios, Nick. Larva described; H. Christoph, Hor. Ent. Ross. xii. pp. 196 & 197.

Ornithoptera heliconoides, sp. n., F. Moore, P. Z. S. 1877, p. 592, S. Andamans.

Papilio laglaizii, Depuiset, Bull. Soc. Ent. Fr. (5) vii. p. clxxi, New Guinea; *P. macilentus*, O. E. Janson, Cist. Ent. ii. p. 158, Japan; *P. macfarlanii*, A. G. Butler, P. Z. S. 1877, p. 471, New Guinea; *P. nyassæ*, id. Ann. N. H. (4) xix. p. 459, Lake Nyassa; *P. opalinus*, id. Tr. E. Soc. 1877, p. 145, pl. iii. fig. 5, Rio Purus; *P. zuddachi*, H. Dewitz, MT. Münch. ent. Ver. i. p. 85, pl. ii. fig. 1, Colombia: spp. nn.

PIERIDÆ.

E. C. Reed figures *Tatochila demodice*, Bl., figs. 1 & 2, *Colias vautieri*, Guér., figs. 3 & 4, and *Catopsilia amphitrite*, Feisth., fig. 5; Marip. Chil. pl. i.

Terias citrina, Poey, var. *portoricensis*, H. Dewitz, S. E. Z. xxxviii. p. 237, Porto Rico.

Pieris rapæ, *napi*, *oleracea*, and all the allied forms of North America and Europe, appear to be only phases of one polymorphic species; H. Edwards, P. Cal. Ac. vi. *P. rapæ*: its extension in North America; W. Saunders, Canad. Ent. ix. pp. 184 & 185. *P. brassicæ*: larvæ unusually abundant and destructive in England in 1876, R. Laddiman, Ent. x. pp. 50 & 51; an hermaphrodite (right side ♀, left side ♂), R. Meldola, P. E. Soc. 1877, p. xxvi. *P. daphnidice*: a mixed hermaphrodite recorded by A. Fuchs, S. E. Z. xxxviii. p. 131. *P. calyce*, W. H. Edw., is probably the spring brood of *P. occidentalis*, Reak.; H. Edwards, P. Cal. Ac. vi. *P. vernalis*, Edw., is only a variety of *P. protodice*, Boisd.; T. E. Bean, Canad. Ent. ix. pp. 201-203. *P. josephina*, Godt., var. *krugi*, from Porto Rico, figured and described by H. Dewitz, l. c. p. 235, pl. i. fig. 3. *P. achantis*, Berg. = *P. vanvolxemi*, Capr.; C. Berg, Bull. Mosc. lii. pp. 1-3, & Ann. Soc. Argent. iv. p. 87; cf. also J. Capronnier, Bull. Ent. Belg. xx. pp. 1 & li.

Tachyris margarita, Hübn., var. *molpadia*, Hübn., from Porto Rico, described and figured by H. Dewitz, l. c. pp. 234 & 235, pl. i. figs. 1 & 2.

Colias (Meganostoma) eurydice, Boisd. Transformations described by H. Edwards, P. Cal. Ac. vi. The autumn brood is described as var. *amorphæ*; id. l. c.

Colias. H. Edwards discusses the Pacific Coast species, and describes some forms doubtfully as new; P. Cal. Ac. vi. *C. edusa*: its abundance

in Britain in 1877; J. T. Carrington, Ent. x. pp. 187-190, 209, 210, 236, & 237; C. G. Barrett, Ent. M. M. xiv. pp. 150 & 151. Its occurrence in Pembrokehire; *id. l. c.* pp. 64-66. *C. hyale*: V. Ghiliani describes an hermaphrodite, right side ♂ and left side ♀, but the left hind wing divided by a longitudinal streak of the colour of the ♂; Bull. Ent. Ital. ix. pp. 248 & 249. Larva noticed; P. C. Zeller, S. E. Z. xxxviii. pp. 283 & 284. *C. pyrrhothea*, Hüb., = *lesbia*, Fabr.; C. Berg, Bull. Mosc. lii. pp. 3-5.

Gonepteryx rhamni with five wings; R. Meldola, P. E. Soc. 1877, p. xxvi. An hermaphrodite, right side ♀, left side ♂; H. Goss, *ibid.*

Anthocharis hyantis, Edw., probably = *creusa*, Doubl.; *A. reakirti*, Edw., is probably the spring brood of *sara*, Bois.: W. H. Edwards, P. Cal. Ac. vi.

New species :—

Leptalis medorilla and *elæ*, W. C. Hewitson, Equat. Lep. pp. 81 & 82, Ecuador.

Elodina pseudanops, A. G. Butler, Ann. N. H. (4) xx. p. 354, Lifu, Loyalty Group.

Terias cingala, Ceylon, and *pallitana*, Bombay, F. Moore, Ann. N. H. (4) xx. p. 48; *T. sinapina* and *lifuana*, A. G. Butler, *l. c.* p. 355, Lifu, Loyalty group; *T. sana*, *id.* P. Z. S. 1877, p. 470, Cape York; *T. oberthuri*, P. Mabille, Bull. Soc. Zool. Fr. 1877, p. 223, Landana.

Pieris lichenosa, F. Moore, P. Z. S. 1877, p. 591, S Andamans; *P. quadricolor*, Salvin & Godman, P. Z. S. 1877, p. 147, pl. xxiii. figs. 3 & 4, Duke of York Island.

Synchlœ sordida and *claripennis*, A. G. Butler, Ann. N. H. (4) xix. p. 96, Shanghai.

Belenois terranea, *id. op. cit.* xx. p. 356, Lifu, Loyalty Group.

Appias mahana, Darjiling, and *nurandra*, Ceylon, F. Moore, Ann. N. H. (4) xx. p. 48.

Daptonura pedrosina, A. G. Butler, Tr. E. Soc. 1877, p. 144, Rio Purus.

Eronia grandidieri, P. Mabille, Bull. Soc. Ent. Fr. (5) vii. p. xxxviii., Madagascar; *E. naraka*, F. Moore, P. Z. S. 1877, p. 591, S. Andamans.

Colias barbara, *chrysomelas*, and *harfordi*, H. Edwards, P. Cal. Ac. vi., California.

Irias kausala, p. 49, Kussowlie, *agnivarna*, Bengal, and *satadra*, Simla, p. 50, F. Moore, Ann. N. H. (4) xx.; *I. andamana*, *id.* P. Z. S. 1877, p. 590, S. Andamans.

Terucolus mutans, Lake Nyassa, and *argillaceus*, Natal, A. G. Butler, Ann. N. H. (4) xix. p. 459; *T. pallens*, F. Moore, *op. cit.* xx. p. 49, Bombay and Canara.

Anthocharis flavida and *guenei*, P. Mabille, *l. c.* pp. xxxvii. & xxxviii., Madagascar.

Zegris fausti, H. Christoph, Hor. Ent. Ross. xii. p. 231, pl. v. figs. 1 & 2, Krasnovodsk.

DANAIDÆ.

Danaïs archippus. Its geographical distribution, habits, and the

causes of its recent wide extension, are discussed by W. L. Distant, Tr. E. Soc. 1877, pp. 93-104. Its occurrence in England; F. Bond, Ent. x. p. 73; P. E. Soc. 1877, p. i. *D. australis*, Hombroen & Jacquemont, noticed from Duke of York Island; Salvin & Godman, P. Z. S. 1877, p. 141. *D. purpurata* and *fulgurata*; varieties noticed by J. Kirsch, MT. Mus. Dresd. i. p. 114. *D. melittula*, *neptunia*, *hamata*, and other allied South Sea species, discussed; J. Mus. Godefr. xii. pp. 161 & 162. *D. leopardus*, Butl., = *limniace*, Cram.; F. Moore, P. Z. S. 1877, p. 584.

Amauris egialea, Cram. P. Mabille regards *inferna*, Butl., as a variety, and describes another variety (*tartarea*) from Landana; Bull. Soc. Zool. Fr. 1876, pp. 198 & 199.

Euplea pierretii, Feld., var. *charox*, from Kordo, *morosa*, Butl. (p. 115), *pumila*, Butl. (of which *trimeni*, Feld., is ♀), and *treitschkei*, Boisd. (p. 117), noticed by J. Kirsch, l. c.

New species :—

Hestia malabarica, F. Moore, Ann. N. H. (4) xx. p. 46, Malabar.

Ideopsis hewitsoni, J. Kirsch, MT. Mus. Dresd. i. p. 114, pl. vi. fig. 1, Mysore Island.

Danaïa nipalensis, Nepal, and *gautama*, Burma, p. 43, *nilgiriensis*, p. 44, Nilgiris, F. Moore, l. c.; *D. melanoleuca*, id. P. Z. S. 1877, p. 584, pl. lviii. fig. 3, S. Andamans.

Euplea coreoides, Malabar, *lankana*, p. 44, *asela* and *sinhala*, all from Ceylon, and *iravada*, Burma, p. 45, id. Ann. N. H. (4) xx.; *E. camorta*, id. P. Z. S. 1877, p. 582, Nicobar Islands; *E. latreillii* (Feld., MS.), p. 115, *sisamis*, New Guinea, *salabanda*, Gilolo, Island of Jobi, pp. 116 & 117, pl. vi. figs. 9 & 8, J. Kirsch, l. c.; *E. unibrunnea*, p. 141, and *browni*, p. 142, pl. xxii. figs. 1 & 2, Salvin & Godman, P. Z. S. 1877, Duke of York Island; *E. whitmeei*, A. G. Butler, Ann. N. H. (4) xx. p. 349, Lifu, Loyalty Group; *E. occulta*, id. P. Z. S. 1877, p. 467, New Guinea.

Salpinx hobsoni, id. l. c. p. 811, Formosa.

HELICONIIDÆ.

Heliconius, *Euides*, *Colenis*, and *Dione*. F. Müller discusses the resemblances between these genera, and refers them all to the same group, distinct from the *Nymphalidæ*; S. E. Z. xxxviii. pp. 492-496.

Hamadryas zoius, Fabr. Variation noticed by J. Kirsch, MT. Mus. Dresd. i. p. 118.

Sais rosalia, Cram., var. *virchowii*, from Puerto Caballo; H. Dewitz, MT. Münch. ent. Ver. i. p. 87, pl. ii. fig. 4.

Ceratinia excelsa, Feld., var. from Costa Rica and Chiriqui described; id. l. c. p. 87.

Heliconius estrella, Bates. A. G. Butler notices a variety (? = *aglaope*, Feld.), from the Ucayali; Ann. N. H. (4) xx. p. 119.

New species :—

Hamadryas aequicinctus, Salvin & Godman, P. Z. S. 1877, p. 142, Duke of York Island.

Eutresis theope, iid. l. c. p. 60, Panama.

Athesis oligyrtis, W. C. Hewitson, Equat. Lep. p. 83, Ecuador.

Mechanitis obscura (= *egaensis*, var. 1, Bates), p. 149; *truncata* (= *egaensis*, var. 2, Bates), *pannifera* (figured, Tr. E. Soc. 1877, pl. iii. fig. 8), *plagigera* and *visenda*, p. 150: A. G. Butler, Cist. Ent. ii. Amazon River.

Napeogenes hemimelæna, Godman & Salvin, l. c. p. 60, Panama.

Leucothyris perspicua, A. G. Butler, Tr. E. Soc. 1877, p. 107, Rio Madeira and Rio Jurua.

Ceratinia castanea, id. l. c. p. 169, pl. iii. fig. 7, Rio Jurua.

Calithomia tridactyla, H. Dewitz, MT. Münch. ent. Ver. i. p. 86, pl. ii. fig. 2, Colombia.

Ithomia melanoptera, p. 83, *inelegans* and *crucifera*, p. 84, *larilla* and *perasippa*, p. 85, *scantilla* and *sulmona*, p. 86, *suesea* and *granica*, p. 87, *mira* and *hara*, p. 88; W. C. Hewitson, l. c., Ecuador. *I. alomena*, Guatemala, *pusio*, Nicaragua, and *zygia*, Chiriqui: Godman & Salvin, l. c. p. 61. *I. petersi*, H. Dewitz, l. c. p. 86, pl. ii. fig. 3, Colombia.

Heliconius lativitta, p. 150, Ega & Guayaquil, *mutabilis* (= *thelxiope*, var. 4, Bates), and *coralii*, p. 151, Serpa, A. G. Butler, Cist. Ent. ii.; *H. fasciatus*, Godman & Salvin, l. c. p. 62, Panama; *H. salvinii*, H. Dewitz, l. c. p. 86, Orinoco.

Euoides kuenowii, id. l. c. p. 89, pl. ii. fig. 5, Santa Martha.

ACRÆIDÆ.

Acraea andromacha, Fabr., very large specimens from Viti; J. Mus. Godefr. Heft xii. p. 174. *A. leucomelæna*, Salv., = *A. nox*, Bates, ♀; Godman, Salvin, & Dewitz, MT. Münch. ent. Ver. i. p. 88, note.

New species :—

Acraea derbela and *ventura*, p. 51, *calderena* and *asema*, p. 52, Lake Nyassa; (*calderena*, also from the Transvaal); *A. zonata* and *buxtoni*, pp. 154 & 155, Zanzibar, W. C. Hewitson, Ent. M. M. xiv.; *A. ara*, id. Equat. Lep. p. 88, Ecuador; *A. turma*, P. Mabilie, Pet. Nouv. ii. p. 158, Madagascar; *A. meyeri*, J. Kirsch, MT. Mus. Dresd. i. p. 123, pl. vi. fig. 2, New Guinea; *A. atrata* and *steini*, H. Dewitz, MT. Münch. ent. Ver. i. p. 88, Colombia.

Actinote sodalis, A. G. Butler, Ann. N. H. (4) xx. p. 119, Ucayali.

Alena nyassa, W. C. Hewitson, l. c. p. 6, Lake Nyassa.

NYMPHALIDÆ.

E. C. Reed figures *Argynnis anna*, Bl., and *cytheris*, Dru., *Euptoieta hortensis*, Bl., and *Pyrameis terpsichore*, Phil., Marip. Chil. pl. i. figs. 6, 8, & 7, & pl. ii. fig. 1.

Cethosia nicobarica, Feld., ♀ described; F. Moore, P. Z. S. 1877, p. 583.

Messaras madestes, Hew., var. from New Guinea; J. Kirsch, MT. Mus. Dresd. i. p. 124.

Argynnis lathonia, var., R. W. Bowyer, Ent. x. p. 46. *A. monticola*, Behr., H. Edwards describes var. *purpurascens*; from California and Oregon; P. Cal. Acad. vi. *A. myrina*, notes on habits of this and allied

species; W. H. Edwards, *Canad. Ent. ix.* pp. 34-36. *A. niobe*, var. *pelopia*, Borkh., described by A. Fuchs, *S. E. Z. xxxviii.* pp. 133 & 134. *A. paphia*: V. Ghiliani describes an hermaphrodite, right side ♂, left side ♀, var. *valesina*; *Bull. Ent. Ital. ix.* pp. 246 & 247. *A. cytheris*, Drury, and *lathonoides*, Blanch., noticed by C. Berg, *An. Soc. Argent. iv.* pp. 88 & 89.

Melitæa artemis, a variety figured; *Ent. x.* p. 193. *M. athalia*, var. *eos*, Haw., figured; S. Stevens, *Ent. x.* p. 145. *M. didyma*, taken near Dumfries; W. Lemon & J. J. Weir, *Ent. x.* pp. 25-27, woodcut. *M. leanira*, Boisd., var. *obsoleta*, from California, described by H. Edwards, *P. Cal. Ac. vi.*

Phyciodes harrisi, Scudd., transformations described by W. H. Edwards; *Canad. Ent. ix.* pp. 165-168. *P. tharos*, Dru., natural history, polymorphism and transformations; *id. l. c.* pp. 1-10, 51-58.

Vanessa. Notes on the hibernating species; F. B. Caulfield, *Canad. Ent. ix.* p. 40. *V. io* and *urticae*: on their stridulation, with magnified drawings of the bases of the wings in the former, showing the structure to which the sound is due; A. H. Swinton, *Ent. M. M. xiii.* pp. 169-172; cf. also F. B. White, *tom. cit.* p. 208. On stridulation in *V. antiopa*; A. V. Jones, *tom. cit. l. c.*

Pyrameis atalanta: on variation in the larva; E. Birchall, *Ent. M. M. xiii.* pp. 209 & 210. Var. with the red markings replaced by coppery yellow; E. Lelièvre, *Pet. Nouv. ii.* p. 107. Hybrid between this species and *P. caryæ*; H. Edwards, *P. Cal. Ac. vi.* *P. huntera*: a third English specimen recorded by A. V. Jones, *Ent. M. M. xiii.* p. 183: another belonging to the Brazilian variety; T. D. Gibson-Carmichael & R. McLachlan, *tom. cit.* p. 230.

Rhinopalpa algina, Blanch., var. ?, noticed by Salvin & Godman, *P.Z.S. 1877*, p. 143, from Duke of York Island.

Eubagis myrson, Doubl., is quite distinct from *E. athemon*, Linn., but is closely allied to *E. decima*, Hew.; A. G. Butler, *Tr. E. Soc. 1877*, p. 117.

Cullicore neglecta, Salv., is not distinct from *C. clymena*, Cram.; *id. Ann. N. H. (4) xx.* pp. 121 & 122.

Catagramma excelsior, Hew., var. from Morão noticed; and the form figured by Hewitson at fig. 64 renamed *C. inferior*; *id. l. c.* p. 122.

Callithea markii, Hew. (fig. 5, *nec* fig. 3), from the Ucayali is renamed *C. davisii*; *id. l. c.* p. 123.

Ageronia feronia: remarks on its stridulation, and the structure of its wings, which exhibit some approach to that of the *Heterocera*; A. H. Swinton, *l. c.* pp. 207 & 208.

Diadema bolina, Linn., on its occurrence in New Zealand; R. W. Fereday, *Tr. N. Z. Inst. ix.* p. 463.

Heterochroa urraca possibly = *erotia*, ♂; A. G. Butler, *Ann. N. H. (4) xx.* p. 124.

Limenitis arboretorum, Oberth., = *Neptis pryori*, Butl.; O. E. Janson, *Cist. Ent. ii.* p. 155. *L. lorquini*, Boisd., var. *eavesi*, from Nevada, described; H. Edwards, *P. Cal. Acad. vi.* *L. proserpina* and *arthemis*, notes on breeding; W. H. Edwards, *Canad. Ent. ix.* p. 114. *L. sibylla*, black variety; W. Watkins, *Ent. M. M. xiv.* p. 89.

Paphia revised by H. Druce, and the number of species raised to 95, 21 being described as new; P. Z. S. 1877, pp. 632-652, pls. lxi.-lxiv. Numerous varieties, undescribed sexes, &c., are noticed, and many synonyms are sunk. He figures *P. polyxo* and *bertha*, Druce, and *P. falcata*, Hoff., pl. lxiv. figs. 2, 3 & 5, and appends a table of the geographical distribution of all the species.

Bolboneura, g. n., Godman & Salvin, P. Z. S. 1877, p. 62. Allied to *Nica*, *Cystineura*, and *Epiphile*; type, *Temenis sylphis*, Bates.

Monura, g. n., P. Mabille, Bull. Soc. Zool. Fr. 1876, p. 280; type, *Pap. zingha*, Cram., = *berenice*, Drury.

Cirrochroa anjira, F. Moore, P. Z. S. 1877, p. 584, S. Andamans; *C. felderi*, J. Kirsch, MT. Mus. Dresd. i. p. 123, pl. vi. figs. 3 & 3 a, New Guinea.

Cynthia insularis, Salvin & Godman, P. Z. S. 1877, p. 143, Duke of York Island.

Argynnis rabdia, A. G. Butler, Ann. N. H. (4) xix. p. 93, Japan; *A. improba*, id. Ent. M. M. xiii. p. 206, Arctic America; *A. macaria*, p. 86, California, and *colombia*, p. 102, British Columbia, W. H. Edwards, Field & Forest, iii.; *A. lysippe* and *fortuna*, O. E. Janson, Cist. Ent. ii. p. 154, Japan; *A. liliana*, H. Edwards, P. Cal. Ac. vi. California; *A. sunides*, W. C. Hewitson, Equat. Lep. p. 89, Ecuador.

Melitæa ulrica and *dymas*, W. H. Edwards, Canad. Ent. ix. pp. 190 & 191; *M. bolli*, id. l. c. Field & Forest, iii. p. 101, all from Texas.

Eresia heliconoides, A. G. Butler, Ann. N. H. (4) xx. p. 120, Ucayali.

Synchlœ tulita, H. Dewitz, S. E. Z. xxxviii. p. 238, pl. i. fig. 4, Porto Rico.

Grapta haroldi, id. M. T. Münch. ent. Ver. i. p. 89, pl. ii. fig. 6, Mexico.

Vanessa hamigera, A. G. Butler, l. c. xix. p. 92, Japan.

Callima albo-fasciata, F. Moore, l. c. p. 584, S. Andamans.

Doleschallia browni, Salvin & Godman, l. c. p. 145, pl. xxii. figs. 3 & 4, Duke of York Island.

Crenis rosa, W. C. Hewitson, Ent. M. M. xiv. p. 82, Delagoa Bay; *C. occidentalis*, P. Mabille, Bull. Soc. Zool. Fr. 1876, p. 275, Gaboon.

Eunica mira, Veragua, *excelsa*, Chiriqui, p. 63, and *cerula*, Guatemala, p. 64; Godman & Salvin, l. c.

Eubagis niveata, p. 116, fig. 3, *limbata*, fig. 2, and *arata*, p. 117, A. G. Butler, Tr. E. Soc. 1877, pl. iii. Rio Madeira; *E. immarginata*, Godman & Salvin, l. c. p. 63, Nicaragua.

Catagramma hazearma, W. C. Hewitson, Equat. Lep. p. 90, Ecuador.

Cyrestis whitmei, A. G. Butler, Ann. N. H. (4) xx. p. 352, Lifu, Loyalty Group; *C. fratercula*, Salvin & Godman, l. c. p. 145, Duke of York Island.

Diadema elsina and *lifuana*, A. G. Butler, l. c. p. 351, Lifu, Loyalty Group; *D. kezia* and *priscilla*, id. P. Z. S. 1877, p. 812, Formosa; *D. inexpectata* and *unicolor*, pl. xxiii. figs. 1 & 2, Salvin & Godman, l. c. p. 144, Duke of York Island.

Hypolinna pithœka, J. Kirsch, l. c. p. 125, pl. vi. fig. 11, New Guinea.

Herona andamana, F. Moore, P. Z. S. 1877, p. 585, S. Andamans.

Parthenos cyaneus, Ceylon, and *virens*, Malabar; *id.* Ann. N. H. (4) xx. pp. 46 & 47.

Heterochroa davisii, A. G. Butler, *op. cit.* p. 124, Ucayali; *H. wallisi*, H. Dewitz, MT. Münch. ent. Ver. i. p. 90, Colombia.

Adelpha juruana, A. G. Butler, Tr. E. Soc. 1877, p. 115, Rio Juruá and East Peru.

Limnitis anartæ, F. Moore, P. Z. S. 1877, p. 585.

Neptis sangaica, p. 47, Chekiang, and *N. disrupta*, p. 339, Ceylon, F. Moore, Ann. N. H. (4) xx.; *N. andamana* and *mananda*, pl. lviii. fig. 4, South Andamans, and *nicobarica*, Nicobar Islands, *id.* P. Z. S. 1877, p. 586; *N. intermedia*, W. B. Pryer, Cist. Ent. ii. p. 231, pl. iv. fig. 1, N. China, Japan.

Athyma pryeri, F. Moore, Ann. N. H. (4) xx. p. 47, Chekiang; *A. zoroastres*, A. G. Butler, P. Z. S. 1877, p. 811, Formosa.

Rhomaleosoma spatiosa, P. Mabille, l. c. p. 278, Congo, Landana.

Harma hecatea, W. C. Hewitson, Ent. M. M. xiii. p. 277, Ashanti.

Symphedra teutoides, F. Moore, P. Z. S. 1877, p. 586, S. Andamans.

Apatura antonia, W. H. Edwards, Field & Forest, iii. p. 103, Texas and Arizona.

Charaxes phæus, W. C. Hewitson, l. c. xiv. p. 82, Delagoa Bay.

Philognomus azota, W. C. Hewitson, l. c. p. 82, Delagoa Bay.

Palla vologeses, P. Mabille, l. c. p. 280, Congo, Landana.

Paphia ops [*P. = andria*, Scudd.], Texas, p. 633, *morella*, Pernambuco, p. 634, figs. 1 & 2, *lemnos*, Chanchomayo, p. 638, fig. 3, *florita*, Chanchomayo, p. 640, fig. 4, *ates*, Bolivia and Rio, p. 641, fig. 5, *cerealia*, Chanchomayo, fig. 6, and *phila*, Bogota, fig. 7, pl. lxi., *boliviana*, Bolivia, pl. lxii. figs. 1 & 2, p. 642, *usita*, Cayenne, pl. lxiii. fig. 1, *lorna*, fig. 3, and *placida*, fig. 4, Bolivia, p. 643, *grandis*, locality unknown, fig. 5, pl. lxii., *offa*, Ecuador, fig. 2, *catinæa*, locality unknown, fig. 3, p. 644, *morta*, Honduras, and *victoria*, figs. 4 & 5, Rio, p. 645, *cambyses*, Chanchomayo, and *lyceus*, New Granada and Ecuador, fig. 6, p. 646, pl. lxiii., *nenia*, St. Paulo, fig. 4, and *laura*, Veragua, p. 647, *phæbe*, Bolivia, fig. 1, p. 648, pl. lxiv., H. Druce, P. Z. S. 1877.

MORPHIDÆ.

Tenaris, Hübn. (= *Drusilla*, Swains.). The following forms are certainly varieties:—*catops*, *myops*, *macrops*, *phorcas*, *artemis*, and *selene*; J. Kirsch, MT. Mus. Dresd. i. p. 120. The following new Papuan varieties of the same series are described:—*D. pamphagus*, p. 120, *gorgo* and *timesias*, p. 121, and *hyperbolus* and *automolus*, p. 122.

Drusilla anableps, Voll., var. ?, noticed from Duke of York Island, by Salvin & Godman, P. Z. S. 1877, p. 143.

Hyantis hodeva, Hew. A variety noticed by J. Kirsch, l. c. p. 123.

Tenaris onesimus, A. G. Butler, P. Z. S. 1877, p. 468, and *T. onolaus*, J. Kirsch, l. c. p. 122, pl. vi. fig. 7, both from New Guinea, spp. nn.

Thaumnantis pseudaliris, A. G. Butler, J. L. S. xiii. p. 115, Malacca; *T. louisa*, J. Wood-Mason, P. A. S. B. 1877, p. 163, Tenasserim: spp. nn.

BRASSOLIDÆ.

Pavonia seleucida and *zolvizora*, W. C. Hewitson, Ex. Butt. v. *Pavonia*, pls. i. & ii., Bolivia, spp. nn.

SATYRIDÆ.

E. C. Reed (Marip. Chil.) figures *Neosatyrys ambiorix*, Wallengr., pl. i. figs. 2 & 3, and pl. ii. fig. 8, *Tetraphlebia germaini*, Feld., fig. 4, *Stibomorphia monachus*, Bl., figs. 5 & 6, *Epinephile limonias*, Phil., fig. 7, *Faunula leucoglène*, Feld., fig. 8, pl. ii.; *Ep. coctet*, Guér., figs. 1 & 3, and var. *pales*, Phil., figs. 6 & 7, *Hipparchia boisduvali*, Bl., fig. 2, and *Stibomorphia reedi*, Butl., fig. 4, pl. iii.

Neope, Butl., said by Scudder to be preoccupied, is renamed *Blanaida*; W. F. Kirby, Suppl. Cat. D. Lep. p. 699.

Euptychia. A. G. Butler (J. L. S. xiii. pp. 116-128) gives a table of the known species, and describes and figures some new ones. *E. nana*, Möschl., = ? *E. hermes*, Fabr., var.; *E. thalessa*, Möschl., probably = *E. batesi*, Butl., var.; *E. galesus*, Godt., is figured: pl. xii. fig. 12.

Neonympha sosybius. Transformations described; W. H. Edwards, Canad. Ent. ix. pp. 229-231.

Erebia gorge, Esp.; var. *triopes*, Spey., noticed and figured by P. Millière, Icon. iii. p. 431, pl. cliii. fig. 10. *E. pyrrha*, var. *pyrrhula* from the Engadine noticed; H. Frey, MT. schw. ent. Ges. iv. pp. 554 & 555.

Chionobas aello, Hübn. The earliest name for this species is *glacialis*, Schrank & Moll, Naturalhist. Briefe, i. p. 102 (1785), P. C. Zeller, S. E. Z. xxxviii. p. 306.

Arge galathea. Variety figured; J. P. Barrett, Ent. x. p. 255.

Melanargia psyche, Hübn. Transformations figured and described by P. Millière, Icon. iii. pp. 275-277, pl. cxxxiii. figs. 1-4.

Pararge clymene, Esp. Larva described and figured, with the imago; id. l. c. pp. 183 & 184, pl. cxix. figs. 1-3.

Epinephile hyperanthus, var. *arete*, Müll., noticed; A. Fuchs, S. E. Z. xxxviii. p. 134. *E. pasiphae*, Esp.: transformations described and figured by P. Millière, Icon. iii. pp. 184-186, pl. cxix. figs. 4-6; var. *philippina*, from Algeria, described by Astant, Pet. Nouv. ii. p. 149.

Satyrys alcione, W. V.: transformations figured and described; P. Millière, l. c. pp. 277-279, pl. cxxxiii. figs. 5-8. *S. boisduvali*, Blanch., and *chilensis*, Guér., noticed by C. Berg, An. Soc. Argent. iv. pp. 89 & 90. *S. nephele*: transformations described by W. H. Edwards, Canad. Ent. ix. pp. 141-143. *S. pelopea*, var. *persica* (Staud., MS.) described by H. Christoph, Hor. Ent. Ross. xx. pp. 201 & 202. *S. wheeleri*, W. H. Edwards, figured and redescribed by him; Butt. N. Amer. ii. *Satyrys*, pl. i.

Argyrophorus argenteus, Blanch., is a true *Satyrys*; C. Berg, Bull. Mosc. lii. pp. 5, 7, & 8.

Mycalopsis macrones, Hew., = *halyma*, Fabr.; *M. mandanes*, Hew., = *auricruda*, Butl.: W. C. Hewitson, Ex. Butt. v. corrections. *M. mucia*, Hew., and *shiva*, Boisd., noticed by J. Kirsch, MT. Mus. Dresd. i. pp. 118 & 119. *M. passandava*, Ward, redescribed; P. Mabille, Pet. Nouv. ii. p. 157.

Cænonympha californica, var. *eryngii*, from California, described by H. Edwards, P. Cal. Ac. vi.

Zabirnia, g. n., W. C. Hewitson, Equat. Lep. p. 92. Affinities uncertain; type, *Z. zigomala*, sp. n., l. c. Bolivia.

New species :—

Pierella incanescens, Godman & Salvin, P. Z. S. 1877, p. 61, Central America.

Lethe lanaris, A. G. Butler, Ann. N. H. (4) xix. p. 95, Shanghai.

Neope fentoni (= *Lasionmata epimenides*, ♀, Ménétr.) and *callipteris*, id. l. c. pp. 91 & 92, Japan.

Zethera thermæa, W. C. Hewitson, Ent. M. M. xiii. p. 178, Philippines.

Idiomorphus sebetus, id. Ex. Butt. v. *Mycalesis*, and id. figs. 6 & 7, Gaboon.

Euptychia anacteta, p. 123, fig. 4, Chiriqui, Bogota, *urbana*, fig. 7, Colombia, *soter*, fig. 11, New Friburg, *benedicta*, fig. 14, Ecuador, p. 124; *melchhiades*, fig. 9, Cordova, *calista*, fig. 8, Bogota, p. 125; *fabiana*, fig. 5, Macahé, *eusebia*, fig. 13, Bogota, *cyclops*, fig. 2, Chiriqui, &c., *ætherialis*, fig. 10, Ecuador, p. 126; *telesiphora*, fig. 1, habitat?, *hygina*, fig. 6, Brazil, p. 127; *clementia*, fig. 3, Chanchomayo. A. G. Butler, J. L. S. xiii. pl. xii.

Erebia nipponica, O. E. Janson, Cist. Ent. ii. p. 153, Japan; *E. turanica*, N. Erschoff, Hor. Ent. Ross. xii. p. 336, Turkestan.

Parargenashreddini (Staud., MS.), H. Christoph, Hor. Ent. Ross. xii. p. 240, pl. v. figs. 13 & 14, Schahrud.

Epinephile promaucana, E. C. Reed, Marip. Chil. p. 55, pl. iii. fig. 5, Chili; *E. gyrtone*, C. Berg, Bull. Mosc. lii. p. 8; An. Soc. Argent. iv. p. 94, Patagonia. *E. capella*, H. Christoph, Hor. Ent. Ross. xii. p. 241, pl. v. fig. 15, pl. vi. fig. 16, North Persia.

Satyrus quies, C. Berg, Bull. Mosc. lii. p. 5, & An. Soc. Argent. iv. p. 91, Buenos Aires and Patagonia; *S. morania*, id. An. Soc. Argent. iv. p. 90, Patagonia.

Mycalesis sambulus, Gaboon, figs. 63 & 64, *sandace*, Fernando Po, fig. 65, *tæniæ* and *technatis*, Gaboon, figs. 66 & 67, W. C. Hewitson, Ex. Butt. v. *Mycalesis* and *Idiomorphus*; *M. ena* and *birsha*, id. Ent. M. M. xiv. p. 107, Lake Nyassa; *M. radza*, F. Moore, P. Z. S. 1877, p. 583, pl. lviii. fig. 1, South Andamans; *M. andrivola* and *masikora*, p. 157, *narova*, *strigula*, and *menamena*, p. 158; P. Mabille, Pot. Nouv. ii. *M. wardi*, id. Bull. Soc. Ent. Fr. (5) vii. p. lxxiii., all from Madagascar. *M. sangaica*, Shanghai and Mongolia, and *simonsi*, Lake Nyassa; A. G. Butler, Ann. N. H. (4) xix. pp. 95 & 458. *M. cacodemus*, J. Kirsch, MT. Mus. Dresd. i. p. 118, pl. vi. figs. 5 & 5 A, New Guinea.

Strabena smithi, P. Mabille, Pet. Nouv. ii. p. 157, Madagascar.

[*H*] *Ypthima beza*, W. C. Hewitson, Ent. M. M. xiv. p. 107, Lake Nyassa.

Cænonympha annulifer, A. G. Butler, l. c. p. 91, Japan.

Triphysa albo-venosa, N. Erschoff, l. c. p. 336, Amoor.

Pronophila phanoclea, p. 90, *phintia* and *praxia*, p. 91; W. C. Hewitson, Equat. Lep., Ecuador.

Oreoschistus gigas, Godman & Salvin, P. Z. S. 1877, p. 62, Guatemala.

EURYTELIDÆ.

Melanitis beza, W. C. Hewitson, Ent. M. M. xiii. p. 179, Philippines.
M. thryallis, J. Kirsch, MT. Mus. Dresd. i. p. 119, pl. vi. fig. 4, New Guinea, spp. nn.

LIBYTHEIDÆ.

Libythea quadrinotata, sp. n., A. G. Butler, Ann. N. H. (4) xx. p. 353, Lifu, Loyalty Group.

ERYCINIDÆ.

Mesene pactolus, Möschl., = *M. sophistes*, Bates; A. G. Butler, Tr. E. Soc. 1877, p. 131.

Tharops felsina, Hew., ♂ described; *id. l. c.* p. 132.

New species:—

Abisara bifasciata, F. Moore, P. Z. S. 1877, p. 587, pl. lviii. fig. 2, S. Andamans.

Mesosemia sylvicolens and *maria*, A. G. Butler, Tr. E. Soc. 1877, pp. 127 & 128, Rio Trombetas; *M. tenebricosa* and *bifasciata*, W. C. Hewitson, Equat. Lep. pp. 93 & 94, Ecuador.

Erycina sepyra, *id. l. c.* p. 94, Ecuador.

Threnodes trochois, *id. l. c.* p. 96, Ecuador.

Cartea traili, A. G. Butler, *l. c.* p. 129, Upper Amazons.

Emesis sinuatus, W. C. Hewitson, *l. c.* p. 95, Ecuador.

Symmachia punctata, A. G. Butler, Tr. E. Soc. 1877, p. 130, Rio Jurua; *S. suevia*, W. C. Hewitson, *l. c.* p. 95, Ecuador.

Mesene trucidata, A. G. Butler, *l. c.* p. 131, Upper Amazons.

Charis australis, W. H. Edwards, Field and Forest, iii. p. 87, San Antonio; *C. subota*, W. C. Hewitson, *l. c.* p. 95, Ecuador.

Metacharis syloes, *id. l. c.* p. 96, Ecuador.

Echenais mollis, pl. iii. fig. 4, Fonteboa, and *sordida*, Upper Amazons, A. G. Butler, *l. c.* p. 133.

Lucilla suberra, W. C. Hewitson, *l. c.* p. 94, Ecuador.

Nymphidium stibopteris, Fonteboa, and *cavifascia*, Prainha; A. G. Butler, *l. c.* p. 135.

Pandemos godmani, H. Dewitz, MT. Münch. ent. Ver. i. p. 89, pl. ii. fig. 7, Vera Cruz.

Stalactis traili, A. G. Butler, *l. c.* p. 137, pl. iii. fig. 1, Rio Mauhes.

LYCENIDÆ.

Chrysophanus. Notes on New Zealand species; R. W. Fereday, Tr. N. Z. Inst. ix. pp. 460-463. He regards *C. feredayi*, Bates, as a good species.

Polyommatus eurydice, var. (?) *eurybia*, Ochs. P. C. Zeller still regards this form as distinct; S. E. Z. xxxviii. pp. 285-287. He also (*l. c.* pp. 287 & 288) describes the larva of *P. doritis*, under which name he sup-

poses Boisduval has figured some other larva. *P. pholas*, Linn.: varieties described by A. Fuchs, S. E. Z. xxxviii. pp. 131-133.

Lycæna. Larva attended by ants for the sake of some secretion; H. C. McCook, Tr. Am. Ent. Soc. vi. pp. 289-291. *L. adonis*, var. *radiata*, p. lxiii., and *L. corydon*, varr. *radiosa* and *lucretia*, p. lxiv., described by A. Gaschet, Bull. Soc. Ent. Fr. (5) vii. *L. argiades*, Pall., var. *polysperchon*, Bergstr., noticed by P. Mabille, Bull. Soc. Ent. Fr. (5) vii. p. lxiv. It is identical with *tiresias*, Hüb., but *polysperchon* of the German writers appears to be distinct. (According to Berce, *tom. cit.* pp. lxx. & lxxi., Mabille's insect is the aberration *coretas*, Ochs., and not the true *polysperchon*.) *L. arion*: notes; G. F. Mathew and others, Ent. x. pp. 35-40, 70-73, 96, 97, 135, & 136. Dwarf specimens; H. Goss, P. E. Soc. 1877, pp. xxiv. & xxv. *L. battus* observed in all four stages at the same time; F. G. Schild, S. E. Z. xxxviii. p. 85. *L. celestina*, Eversm., noticed and figured by P. Millière, Icon. iii. pp. 440 & 441, pl. clii. fig. 3. This species, as well as *L. meleager*, Esp., and *agestor*, Godt. (*cf.* p. 441, note), is new to the Maritime Alps. *L. christophi*, Staud., and *tengstræmi*, Ersch.: larvæ described by H. Christoph, Hor. Ent. Ross. xii. p. 199. *L. christophi* (imago) is figured and redescribed by P. Millière, *l. c.* pp. 419 & 420, pl. clii. figs. 2 & 3. *L. damon*, Esp.: H. Christoph describes and figures varr. *phyllis* (Staud. MS.), figs. 9 & 10, and *posithumus*, fig. 1, both from Schalkuh; *l. c.* pp. 237 & 238, pl. v. *L. icarus*, Rott.: blue varieties of the female; A. Fuchs, *l. c.* p. 133. *L. kandarpa*, Horsf., and *asoka*, Koll., = *strabo*, Fabr.; F. Moore, P. Z. S. 1877, p. 588. *Hypochrysops epicletus*, Feld., ♀ described by J. Kirsch, MT. Mus. Dresd. i. p. 127.

Thecla. W. C. Hewitson (Ill. D. Lep.) redescribes and figures *T. cyphara*, Hew., p. 186, pl. lxxiv. figs. 579 & 580, *calus*, Godt., p. 188, figs. 585 & 586, *camissa*, Hew. (= *charichlorus*, Butl. & Druce), p. 189, figs. 595 & 596, pl. lxxv., *cyrriana*, Hew., p. 195, figs. 625 & 626, *mathewi*, Hew., p. 196, figs. 629 & 630, *critola*, Hew., figs. 633 & 634, and *chonida*, Hew., figs. 635 & 636, p. 197, *sedecia*, Hew., p. 198, figs. 637 & 638, pl. lxxviii., *circinata*, Hew., p. 199, pl. lxxix. figs. 645 & 646, *longula*, Hew., p. 200, figs. 651-654, *remus*, Hew., p. 201, figs. 655 & 656, *badeta*, Hew., var. *melba*, p. 202, figs. 657 & 658, *lycimna*, Hew., p. 203, figs. 663-665, Brazil, pl. lxxx., *crambusa*, Hew., p. 205, pl. lxxxi. figs. 678 & 679, *herodotus*, Fabr. (= *leucania*, Hew.), p. 205, pl. lxxxii. fig. 680, *americensis*, Blanch., p. 207, figs. 693 & 694, *bicolor*, Phil., p. 208, figs. 695-697, and *quaderna*, Hew., p. 209, figs. 703 & 704, pl. lxxxiii. *T. quercus*: note on egg and food-plant; J. Hellins, Ent. M. M. xiv. p. 112. Feeding on sallow; G. C. Bignell, Ent. x. p. 285. *T. sæpium*, var. *melinus*, and *T. melinus*, var. *pudica*, both from California, described by H. Edwards, P. Cal. Ac. vi. *T. melinus*, Boisd., and *humuli*, Harr., are probably not truly distinct; *id.* *l. c.* *T. rubi*: on the stridulation of the pupa; F. G. Schild, S. E. Z. xxxviii. pp. 85-87, transl. Ent. M. M. xiv. p. 137. Larva feeding on *Ulex scoparius*; J. Hellins, *op. cit.* xiv. pp. 112 & 113.

Bithys punctum, var. ? noticed as taken at light at Maturá; A. G. Butler, Tr. E. Soc. 1877, p. 138.

Dipsas tazila, Hew., = *Thecla japonica*, Murr., *T. orientalis*, Murr., also noticed ; O. E. Janson, Cist. Ent. ii. p. 156.

Amblypodia hercules, Hew., ♀, noticed by J. Kirsch, l. c. p. 127.

New species :—

Chrysophanus mauri (= *salustius*, ♂, Butl., Cat. Lep. N. Z. fig. 3), and *rauparaha*, R. W. Fereday, Tr. N. Z. Inst. ix. p. 462, New Zealand.

Polyommatus lavendularis, p. 341, *lanka* and *singalensis*, p. 342, F. Moore, Ann. N. H. (4) xx. Ceylon.

Lampides lithargyria and *viola*, p. 340, *coruscans* and *prominens*, p. 341 ; *id. l. c.* Ceylon. *L. florinda*, A. G. Butler, tom. cit. p. 354, Lifu, Loyalty Group. *L. filicaudis*, W. B. Pryer, Cist. Ent. ii. p. 231, North China.

Lycæna delicatula, Congo, p. 215, *darius* (Boisd., MS.), Congo and Red Sea, p. 216, *adherbal*, Landana and Chinchonxo, and *pyrrhops*, Landana, p. 217, *conguensis*, Congo, p. 218, and *æthiops*, Chinchonxo, p. 219 ; P. Mabille, Bull. Soc. Zool. Fr. 1877. *L. rabefaner* and *delicatula*, p. lxxi, *smithi*, *scintilla*, *reticulum* and *antanossa*, p. lxxii. ; *id.* Bull. Soc. Ent. Fr. (5) vii. all from Madagascar. *L. conformis*, A. G. Butler, P. Z. S. 1877, p. 469, Cape York. *L. striata*, W. H. Edwards, Field and Forest, iii. p. 88, San Antonio. *L. alcedo*, figs. 3 & 4, and *cytis*, figs. 5 & 6, both from Schahkuh, *myrmecias*, fig. 7, Krasnovodsk, and *ædon*, fig. 8, Schahkuh, pp. 233–236, *anthracias*, p. 239, fig. 12, Krasnovodsk ; H. Christoph, Hor. Ent. Ross. xii. pl. v. *L. speciosa*, H. Edwards, P. Cal. Acad. vi., California.

Cupido improba, E. C. Reed, Marip. Chil. p. 67, Chili.

Thecla ceromia, pl. lxxiv. figs. 573 & 574, Amazon, and var. *suada*, from Bolivia, p. 207, pl. lxxxii. figs. 691 & 692, and *galliena*, figs. 575 & 576, Chontales and Espiritu Santo, p. 185, *collucia*, figs. 577 & 578, locality unknown, p. 186, *calena*, figs. 581 & 582, Chontales, and *canacha*, Venezuela, figs. 583 & 584, p. 187, pl. lxxiv., *caulonia*, figs. 587 & 588, Rio Janeiro, and *cissusa*, figs. 589 & 590, Para, p. 188, *thama*, figs. 591 & 592, Santa Martha, *cinniana*, figs. 593 & 594, Amazon, p. 189, *gargophia*, p. 190, figs. 597 & 598, Brazil, pl. lxxv., *vibulena*, p. 190, figs. 599–603, S. America, *anthora*, figs. 604–606, Amazon and Cayenne, *cerata*, figs. 607 & 608, Para, p. 191, *aruma*, p. 192, figs. 609 & 610, Espiritu Santo, p. 192, *xeneta*, figs. 611 & 612, Brazil and Chontales, *vitruvia*, fig. 613 bis, Para, and *capeta*, figs. 614 & 615, Nicaragua, p. 193, *autoclea*, figs. 616 & 617, Chontales, *bellera*, fig. 618, Amazon, *bactra*, figs. 619 & 620, Nicaragua, p. 194, *amplia*, figs. 621 & 622, Chontales, *cabiria*, figs. 623 & 624, Brazil, p. 195, pl. lxxvii., *rufio-fusca*, p. 196, figs. 627 & 628, *gizela*, p. 197, figs. 631 & 632, Bolivia, pl. lxxviii., *elsa*, figs. 639 & 640, Chiriqui, *geba*, figs. 641 & 642, locality unknown, p. 198, *petelina*, p. 199, figs. 643 & 644, *dodava*, figs. 647 & 648, Chiriqui, and *orsina*, figs. 649 & 650, Bolivia, p. 200, pl. lxxx., *chloris*, figs. 659 & 660, Brazil, and *facuna*, figs. 661 & 662, locality unknown, p. 202, pl. lxxx., *goleta*, figs. 666 & 667, New Granada, and *sapota*, figs. 668 & 669, Payta, p. 203, *ligia*, figs. 670–672, Santa Martha, and *nipona*, figs. 673–675, Brazil, p. 204, and *legota*, p. 205, figs. 676 & 677, Bolivia, pl. lxxxi., *socigena*, p. 205, figs. 681 & 682, Santa Martha, *scoteia*, figs. 683 & 684, Minas Geraes, *partunda*, figs. 685 & 686, Amazon and Bolivia,

muatta, figs. 687 & 688, Brazil, p. 206, *strenua*, p. 207, figs. 689 & 690, Brazil, pl. lxxxii., *tadia*, figs. 698 & 699, Brazil, *argiva*, figs. 700-702, Venezuela, p. 208, and *argerona*, p. 209, figs. 705 & 706, Minas Geraes, pl. lxxxiii.; W. C. Hewitson, Ill. D. Lep.

Thecla mera, p. 156, *enthea* and *jonasi*, p. 157; O. E. Janson, Cist. Ent. ii., Japan. *T. sheridoni*, Big Horn Mountains, and *clytie*, San Antonio; W. H. Edwards, l. c. iii. pp. 48 & 88. *T. putnami*, p. 143, Utah and Colorado, and *adenostomatis*, p. 144, California; H. Edwards, P. Cal. Ac. vii.

Tmolus atrox, Rio Purus, *clitumnus* (Doubl., MS.), pl. iii. fig. 6, Prainha, and *pereza*, Prainha and Rio Juruá; A. G. Butler, Tr. E. Soc. 1877, p. 140.

Dipsas birupa, F. Moore, l. c. p. 51, Masuri.

Aphnaeus elima, N. W. India, and *formosanus*, Formosa, id. l. c. p. 51; *A. zoilus*, id. P. Z. S. 1877, p. 588, S. Andamans.

Hypolycena andamana, id. P. Z. S. 1877, p. 589, S. Andamans.

Poritia pediada, W. C. Hewitson, Ent. M. M. xiii. p. 223, Singapore.

Myrina prabha, F. Moore, l. c. p. 589, pl. lviii. fig. 5, S. Andamans.

Deudorix dariaves, W. C. Hewitson, l. c. p. 205, Delagoa Bay.

Curetis acuta and *truncata*, F. Moore, Ann. N. H. (4) xx. pp. 50 & 51, Shanghai; *C. saronis*, id. P. Z. S. 1877, p. 587, S. Andamans.

Amblypodia crabyle and *eucolpis*, J. Kirsch, MT. Mus. Dresd. i. p. 128, pl. vi. figs. 10, 10 A, & 6, 6 A, New Guinea; *A. zeta*, F. Moore, l. c. p. 590, pl. lviii. fig. 6, S. Andamans; *A. avidiena*, W. C. Hewitson, l. c. xiv. p. 108, China; *A. ? hewitsoni*, P. Mabille, Bull. Soc. Zool. Fr. 1877, p. 221, Landana.

HESPERIIDÆ.

W. H. Edwards (Cat. Lep. Amer. pp. 63-67) publishes Speyer's arrangement of the North American *Hesperiidæ*, with characters of the genera. As Edwards does not recognize Hübner's or Scudder's genera, their names when used are most improperly credited to subsequent authors. The arrangement will stand as follows:—Section 1, *Carterocephalus*, *Ancyloxypha*, *Copæodes*, *Thymelicus*, *Pamphila*, *Amblyscirtes*. Section 2, *Pyrgus*, *Thanaos*, *Lintneria*, *Pholisora*, and *Eudamus*.

Telemiades, Hübner, recharacterized; P. Mabille, Pet. Nouv. ii. p. 165.

Pamphila ochracea, *subhyalina* and *zonata*, and *Cyclopides ornatus*, Brem., p. 159, and *Isoteinon lamprospilus*, Feld. (= *Pamphila vitrea*, Murr.), p. 160, noticed by O. E. Janson, Cist. Ent. ii.; *P. ignita*, P. Mabille, redescribed by him, Bull. Soc. Zool. Fr. 1877, p. 234.

Entheus infernalis, Möschl., and *Phareas hesychius* = *P. neleus*, Linn., ♂; A. G. Butler, Tr. E. Soc. 1877, p. 149.

Pamphila silius, Godt., redescribed and figured; H. Dewitz, S. E. Z. xxxviii. p. 243, pl. i. fig. 5.

Gegenes, Hübner, recharacterized by P. Mabille, l. c. p. 231. He divides it into two sections, the type of the first being *mathias*, Fabr., followed by *julianus*, Laf., and ? *fatuellus*, Hopff.; and the representatives of the second being *borbonicus* and *poutieri*, Boisd., *guttatus*, Brem., and *chayn*, Moore.

Pardaleodes rutilans, P. Mabille, redescribed by him from Congo and Landana, *l. c.* p. 235.

Syrichthus malvee, Linn., transformations described; P. C. Zeller, S. E. Z. xxxviii. pp. 309-311.

Pyrgus crisia, Herr. Schöff., figured by H. Dewitz, *l. c.* pl. i. fig. 6.

Ancistrocampa syllius, Feld., is probably distinct from *A. hiarbas*, Cram.; W. C. Hewitson, Ann. N. H. (4) xx. p. 324.

Cyclopides crithote, Hew., = *Nisniades ibhara*, Butl.; W. C. Hewitson, Ex. Butt. v. corrections.

Tugiades, Hübner. P. Mabille proposes to restrict this name to *ophion*, Dru., and allies, and redescribes his *T. lacteus*, from the Congo; *l. c.* p. 238.

Megathymus yuccæ, Walk. [Boisd. & Lec.]. Note on transformations; it is single-brooded; C. V. Riley, Rep. Ins. Mo. ix. p. 129.

New genera and species :—

Eurypterus, P. Mabille, Pet. Nouv. ii. p. 162. Allied to *Telegonus*, &c. Type, *E. gigas*, sp. n., *l. c.*, Peruvian Andes.

Tanyptera, id. Bull. Soc. Zool. Fr. 1877, p. 230. Allied to *Ismene*; types *Hesperia lauffella*, Hew., and *H. ismene* and *celsina*, Feld.

Mycteris, id. Pet. Nouv. ii. p. 114. Allied to *Proteides* and *Carystus*; type, *M. carula*, sp. n., *l. c.*, Colombia.

Camptopleura, id. *l. c.* p. 166. Allied to *Thanaos*; type, *C. theramenes*, sp. n., *l. c.*, locality unknown.

Copæodes, A. Speyer, Edward's Cat. Lep. Amer. pp. 49 & 56. Allied to *Ancylorhiza* and *Thymelicus*; type, *Heteropterus procris*, Edw.

Lintneria, A. G. Butler, op. cit. pp. 57 & 67; type, *Pap. daunus*, Cram. [This name has been already applied to two other genera of North American *Lepidoptera*.]

Goniurus esmeraldus, A. G. Butler, Tr. E. Soc. 1877, p. 146, Villa Bella.

Thymele orestes, J. A. Lintner, Rep. N. Y. S. Mus. xxviii., Texas (= *epigena*, Butl.).

Eudamus helixus, p. 320, locality unknown, and *halesius*, p. 321, Cayenne; W. C. Hewitson, Ann. N. H. (4) xx. *E. virescens*, Cayenne, and *concinus*, Brazil; P. Mabille, Bull. Soc. Ent. Fr. (5) vii. p. xxxix.

Telegonus megalurus, *anthracinus*, and *T. (?) albo-ciliatus*, id. Pet. Nouv. ii. p. 162, Colombia; *T. labriaris*, A. G. Butler, *l. c.* p. 148, Rio Purus.

Æthilla infanda, id. *l. c.* p. 149, Tunantins.

Phareas berytus, W. C. Hewitson, *l. c.* p. 324, locality unknown.

Ismene unicolor, P. Mabille, Bull. Soc. Ent. Fr. (5) vii. p. xxxix., & Bull. Soc. Zool. Fr. 1877, p. 230, Congo; *I. militas*, J. Kirsch, MT. Mus. Dresd. i. 128, pl. vii. fig. 6, New Guinea.

Pyrrhopyga hospita, A. G. Butler, Ann. N. H. (4) xx. p. 128, Ucayali; *P. semidentata*, East Peru, and *luteizona*, Mexico, P. Mabille, Pet. Nouv. ii. pp. 161 & 162.

Myxcelus orthrus and *typhaon*, W. C. Hewitson, *l. c.* pp. 319 & 320, locality unknown.

Carystus hypoxanthus, P. Mabille, *l. c.* p. 114, Cayenne.

Plesioneura proxima, Mabilie, Bull. Soc. Zool. Fr. 1877, p. 231, Congo.

Gegenes sinensis, North China, *contigua* and *javana*, Java, and *elegans*, locality not mentioned, p. 232 (note), and *leucosoma*, p. 233, *id. l. c.*

Telemiades lurideolus, Brazil, *littera*, Peru, *inops* and *hyacinthus*, locality unknown, *id. Pet. Nouv. ii.* p. 165.

Hesperia gonessa, Angola, p. 76, *fiscella*, Para, *zema*, Darjeeling and Sarawak, and *zimra*, Brazil, p. 77, *oropa*, Brazil, and *goza*, Venezuela, p. 78, *meza*, Angola, *galesa*, W. Africa, and *fibrena*, Tunantins, p. 79, *maheta*, Queensland, and *luda*, Chiriqui, p. 80, *mytheca*, Malacca, *fidicula*, Costa Rica, and *fufidia* and *lota*, locality unknown, p. 81, *meda*, Brazil, *uza*, locality unknown, *egla*, Chiriqui, *kora*, Brazil, *midia*, Chiriqui, and *abima*, Macassar, p. 83, *hazarma*, locality unknown, and *neba*, Natal, p. 84, *optata* and *onasima*, Brazil, p. 85, W. C. Hewitson, *l. c.* xix.; *H. atroæ*, A. G. Butler, *l. c.* p. 357, Lifu, Loyalty Group; *H. cahira*, p. 593, fig. 8, and *colaca*, p. 594, fig. 7, F. Moore, P. Z. S. 1877, pl. lviii., S. Andamans; *H. valdiviana* (? = *notata*, Blanch., var., nec *valdivianus*, Phil.) and *fusca*, E. C. Reed, Marip. Chil. p. 81, Chili; *H. amygdalis*, P. Mabilie, Bull. Soc. Zool. Fr. 1877, p. 234, note, Nossi-Bé and Madagascar.

Pamphila sodalis, Obydos, p. 150, *alumna*, Rio Juruá, &c., *allubita*, Obydos, &c., and *ancillaris*, Rio Trombetas, p. 151, *chydea*, Serpa, *compta*, Rio Trombetas, &c., and *confica*, Parentins, p. 152, *evans* and *stictomenes*, Rio Trombetas, &c., p. 153, A. G. Butler, Tr. E. Soc. 1877; *P. osceola*, J. A. Lintner, Rep. N. York Mus. xxviii., California; *P. mencia*, F. Moore, Ann. N. H. (4) xx. p. 52, Shanghai; *P. gola* and *purreea*, *id. P. Z. S.* 1877, p. 594, pl. lviii. figs. 9 & 10, S. Andamans; *P. kirbii*, E. C. Reed, *l. c.* p. 78, Chili; *P. snowi*, Colorado, and *meskii*, Texas, W. H. Edwards, Canad. Ent. ix. pp. 29 & 58; *P. splendens*, East Africa, *nitida*, Philippines, and *leucosoma*, W. Africa, P. Mabilie, Pet. Nouv. ii. p. 114; *P. ignita*, *id. Bull. Soc. Ent. Fr.* (5) vii. p. xl., Congo.

Amblyscirtes nysa, W. H. Edwards, *l. c.* p. 191, Texas.

Pholisora nessus, *id. l. c.* p. 192, Texas.

Pyrgus sinicus, A. G. Butler, Ann. N. H. (4) xix. p. 96, Shanghai; *P. conyzæ*, A. Guénée, Pet. Nouv. ii. p. 145, Savoy.

Ancistrocampta suthina, W. C. Hewitson, *l. c.* xx. p. 324, Ecuador.

Plesioneura rutilans, P. Mabilie, Bull. Soc. Ent. Fr. (5) vii. p. xl., Congo.

Pardaleodes fulgens (*rutilans*, ♂, Mabilie, *vide supra*) and *pusiella*, *id. Bull. Soc. Zool. Fr.* 1877, pp. 236 & 237, both from Congo and Landana.

Cyclopides eburones, Bolivia, p. 324, *ligilla*, locality unknown, *eryonas*, Chiriqui, *evages*, Bolivia, p. 325, *ozaites*, Bolivia, *diraspes*, Rio de Janeiro, *orsines*, locality unknown, p. 326, *talaon*, Ecuador, *chersias*, S. Africa, *derbice*, Nyassa, p. 327, and *dardaris*, Mexico, p. 328, W. C. Hewitson, *l. c.*; *C. leucopyga* and *dispar*, P. Mabilie, Bull. Soc. Ent. Fr. (5) vii. pp. lxxii. & lxxiii., Madagascar.

Butleria sotoi, *canquensis*, and *vicina*, E. C. Reed, *l. c.* pp. 86-88, Chili.

Pythonides deyrollii, P. Mabilie, Pet. Nouv. ii. p. 114, Cayenne.

Nisoniades cupreus, *id. Bull. Soc. Ent. Fr.* (5) vii. p. xl., Brazil; *N.*

pacuvius, J. A. Lintner, *l. c.*, Arizona; *N. pirus*, W. H. Edwards, Field and Forest, iii. p. 119, Colorado.

Achyodes eclipctica, p. 154, *exosa* (♀ taken at light) and *nyctineme* (Boisd., MS.), p. 155, A. G. Butler, Tr. E. Soc. 1877, Amazons; *A. hæmatites*, P. Mabille, Pet. Nouv. ii. p. 114, Brazil.

Pterygospidea simula, Sumatra, p. 321, *badia*, Darjeeling, *shema*, Cayenne and Calabar [?], *medetrina*, Fernando Po, p. 322, *boadicea*, Gaboon, and *tergemira*, Fernando Po, p. 323, W. C. Hewitson, *l. c.*; *P. bouvieri*, Gaboon and Congo, and *lalius* (Plötz, MS.), Gaboon, P. Mabille, Bull. Soc. Zool. Fr. 1877, pp. 239 & 240.

Tagiades astrigera, A. G. Butler, *l. c.* p. 155, Rio Tapajos; *T. alica*, F. Moore, P. Z. S. 1877, p. 593, pl. lviii. fig. 11, S. Andamans; *T. minuta*, id. Ann. N. H. (4) xx. p. 343, Ceylon; *T. lacteus*, Congo, and *elegans*, Philippines, P. Mabille, Bull. Soc. Ent. Fr. (5) vii. pp. xxxix. & xl.

SPHINGIDÆ.

The classification of several of the groups formerly classed as *Sphinges* and *Bombyces* is discussed by A. Guénée, Ann. Soc. Ent. Fr. (5) vii. pp. 276-278.

A. G. Butler has published a Revision of the Heterocerous *Lepidoptera* of the family *Sphingidæ*; Tr. Z. S. ix. pp. 511-644, pls. xc.-xciv., figuring and describing many new species and unpublished transformations. He divides the *Sphingidæ* into the six following subfamilies:—*Macroglossinæ*, *Cherocampinæ*, *Ambulicinæ*, *Smerinthinæ*, *Acherontiinæ*, and *Sphinginæ*. The paper is preceded by a sketch of the principal systematic works on the group, a list of genera, showing their range, and the characters of the subfamilies. At the end is given a short summary of Boisduval's new species. The Recorder cannot here attempt to notice the numerous corrections of synonymy and minor notes in this important Revision.

A. G. Butler figures and redescribes *Cherocampa crotonis* and *Darapsa rhodocera*, Walk., p. 1, figs. 1 & 2, and his own *Ambulyx marginata*, *Diludia brevimargo* and *rufescens*, p. 3, figs. 4-6, and *Dolba hartwegi*, p. 3, fig. 3; Ill. Lep. Het. i. pl. xv.

W. F. Kirby (Tr. E. Soc. 1877, pp. 233-244) publishes notes on new or rare *Sphingidæ* in the Museum of the Royal Dublin Society, making some additions and corrections to Butler's recent revision of the family, and describing several new species.

A. R. Grote, Canad. Ent. ix. pp. 130-133, discusses Butler's notes on N. American *Sphinges*.

List of 12 *Sphingidæ* taken at sugar at Center, N. Y.; J. S. Bailey, tom. cit. p. 240.

Hemaris cunninghami, Boisd., nec Walk., = *H. kingi*, MacL.; *H. cyaniris*, Guér., is redescribed: W. F. Kirby, Tr. E. Soc. 1877, pp. 233 & 239. *H. hylas*, Linn.: larva and pupa figured; A. G. Butler, Tr. Z. S. ix. pl. xc. figs. 4 & 5.

Macroglossa belis, Cram., figs. 6 & 7, *pyrrhosticta*, Butl., fig. 8, and *gilia*, Herr. Schäff., figs. 9 & 10, larvæ and pupæ figured, pl. xc.; *M. alcedo*, Boisd., *gilia*, Herr. Schäff., and *erato*, Boisd., noticed, pp. 526, 527,

& 529 : A. G. Butler, *l. c.* *M. croatica*, Esp. : transformations described and figured by P. Millière, Icon. iii. pp. 329 & 330, pl. cxliii. figs. 7-9.

Aelopus hiruendo, Gerst., redescribed ; A. G. Butler, *l. c.* p. 531.

Pachygonia, Feld., characterized ; *id. l. c.* p. 533. Allied to *Eupyr-rhoglossum* ; type, *Perigonía subhamata*, Walk. (= *caliginosa*, Boisd. & Feld.).

Thyreus nessus : larva, &c., described ; W. V. Andrews, Canad. Ent. ix. p. 20.

Pterogon gorgon, Esp. Larva and varieties described and figured by P. Millière, Icon. iii. pp. 173-175, pl. cxii. figs. 3-5. It is not congeneric with *P. cnothæwæ*, W. V.

Enyo excisa, Walk., referred by Butler to *Lophura*, is congeneric with *Tennora rhadanistus*, Fabr. ; *E. gorgon* and *lyctus*, Cram., are distinct : W. F. Kirby, *l. c.* p. 234.

Lophura hyas, Walk. Larvæ and pupa figured and noticed by A. G. Butler, *l. c.* p. 538, pl. xc. figs. 1-3. The horn is very long and slender, and that of one larva is frequently devoured by another.

Calliomma parce, Fabr., and *galianna*, Burm. redescribed ; *id. l. c.* p. 539.

Acosmeryx miskini, Murr., and *daulis*, Boisd., probably = *Enyo cinna-momea*, Herr. Schöff., W. F. Kirby, *l. c.* p. 234. A. G. Butler (*op. cit.* p. 396) considers them distinct.

Acosmeryx anceus, Cram. Larva and pupa figured by A. G. Butler, Tr. Z. S. ix. pl. xc. figs. 11 & 12.

Ampeolophaga rubiginosa, Brem. & Grey. Larva and pupa figured ; *id. l. c.* pl. xci. figs. 4 & 5.

Pergesa egrata and *gloriosa*, A. G. Butler, figured by him, *l. c.* pl. xcii. figs. 2 & 3. He also (*l. c.* pl. xci. figs. 14 & 15) figures the larva and pupa of his *P. mongoliana*.

Panacra regularis and *ella*, A. G. Butler, figured by him ; *l. c.* pl. xcii. figs. 4 & 7.

Microlophia sculpta, Feld., g. & sp. characterized ; *id. l. c.* p. 552. Allied to *Pergesa* and *Panacra* ; hab. South India.

Gnathostypsis, Wallengr., recharacterized ; *id. l. c.* p. 553.

Cherocampa levisi, Butl., pl. xc. figs. 13-15, p. 554, *oldenlandiæ*, Fabr., pl. xci. fig. 1, p. 559 ; *japonica*, Boisd., pl. xci. figs. 7-9, and *silhetensis*, Walk., pl. xcii. fig. 8, p. 560. Larvæ and pupæ noticed and figured ; *id. l. c.* The larva of *C. nessus*, Dru., is also noticed at p. 565. Butler also (*l. c.* pl. xcii. fig. 1, & pl. xciv. figs. 1 & 2) figures the perfect insects of his *C. mirabilis*, *docilis*, and *virescens*. *C. butus*, Herr. Schöff., is allied to *C. lucasi*, Walk., and is quite distinct from *punctivenata*, Butl., *id.*, Tr. E. Soc. 1877, p. 396 ; *C. erotus*, Cram., var. *andamanensis* described, W. F. Kirby, *tom. cit.* p. 242.

Darapsa, Walk., recharacterized by A. G. Butler, Tr. Z. S. ix. p. 567, who selects *D. rhodocera*, Walk., as the type. [But this cannot stand, for as *Otus*, Hübn., is pre-occupied, the name *Darapsa* must be retained as used by American authors.]

Dilephila chamæneri and *lineata* described, and larvæ and perfect insects figured ; W. Saunders, Canad. Ent. ix. pp. 63-67. *D. mauritanica*,

Staud. ; the larva is intermediate between that of *euphorbiae* and *galii*, H. Christoph, Hor. Ent. Ross. xii. p. 203.

Philampelus, Harr. The characters of several species are discussed by A. G. Butler, *l. c.* pp. 574–578. *P. satellitia* is probably double-brooded in the south ; R. Bunker, Canad. Ent. ix. p. 120.

Ambulyx liturata (pl. xci. figs. 2 & 3, larva and pupa), *turbata*, *rhodoptera*, and *lahora* (pl. xciii. figs. 7–9, perfect insects), Butler, are figured by him, *l. c.* He also (*l. c.* p. 579) describes *A. strigilis*, var. *rubicundus*, from Haiti.

Polyptychus dentatus, Cram. Larva noticed and figured, *id. l. c.* p. 584, pl. xci. fig. 10.

Euclea, Boisd. (pre-occupied), is renamed *Lophostethus* ; *id. l. c.* p. 585.

Langia zenzeroides, Moore. The larva produces a hissing sound ; W. C. Gott, Ent. M. M. xiv. pp. 116 & 117.

Triptogon spectabilis, *fuscescens*, *oriens*, *massuriensis*, and *albicans*, A. G. Butler, figured by him ; *l. c.* pl. xciii. figs. 1–3, 5 & 6. *T. roseipennis*, Butler, larva figured ; *id. l. c.* pl. xci. fig. 6.

Smerinthus tatarinovii, Mén., and *planus*, Walk. ; larvæ noticed and figured by A. G. Butler, *l. c.* p. 593, pl. xc. fig. 16, & pl. xcii. fig. 11. *S. modesta*, Harr. ; transformations described, R. Bunker, *l. c.* pp. 210 & 211.

Leucophlebia lineata, Westw. Amplified description ; A. G. Butler, *l. c.* p. 594.

Basiana exusta, A. G. Butler, figured by him, *l. c.* pl. xciii. fig. 4.

Acherontia atropos : remarks on its stridulation ; A. H. Swinton, Ent. M. M. xiii. pp. 217–220. *A. morta*, Hübn. : larva figured by A. G. Butler, *l. c.* pl. xcii. fig. 9. *A. satanas*, Boisd. : variation ; P. C. T. Snellon, Tijdschr. Ent. xx. p. 4.

Amphonyx rivularis, A. G. Butler, figured by him, *l. c.* pl. xciv. fig. 6.

Anceryx, Walk., recharacterized, and restricted to *Sphinx alope*, Dru., and *fasciata*, Swains. ; *id. l. c.* p. 600.

Isognathus metascyron, A. G. Butler, figured by him, *l. c.* pl. xciv. fig. 7.

Macrosila incisa, Walk., and *hannibal*, Cram., noticed, and the generic name restricted to them ; *id. l. c.* p. 605.

Protoparce abadonna, Fabr. (= *Sphinx godarti*, Macl.), noticed ; W. F. Kirby, *l. c.* p. 238.

Pseudosphinx cyrtolophia, A. G. Butler, figured by him in all stages ; *l. c.* pl. xci. figs. 11–13, pl. xcii. fig. 6.

Euryglottis, Boisd., recharacterized ; A. G. Butler, *l. c.* p. 612.

Diludia melanomera and *natalensis*, pl. xciv. figs. 4 & 5, and *vates*, pl. xci. figs. 18 & 19 (larva and pupa only), all of A. G. Butler, figured by him, *l. c.*

Sphinx abietina, Boisd., and *convolvuli*, Linn. Larvæ described by Piepers & Snellen, Tijdschr. Ent. xx. pp. 2–4.

Systasea, A. G. Butler. New name for *Lintneria*, Edw. (pre-occupied) ; W. H. Edwards, Canad. Ent. ix. p. 120.

Nephele rosæ, Butl., p. 622, pl. xciv. fig. 3, and *hespera*, Fabr., p. 624, pl. xci. figs. 20 & 21 (larva and pupa only), figured by A. G. Butler, *l. c.*

Nephele vani, Walk., noticed ; W. F. Kirby, *l. c.* p. 239.

New genera and species :—

Himantoides, A. G. Butler, Tr. Z. S. ix. p. 626, Tr. E. Soc. 1877, p. 395. Allied to *Perigonia*; type, *P. undata*, Walk., noticed and figured, l. c. pl. ix. fig. 1; redescribed by W. F. Kirby, Tr. E. Soc. 1877, p. 240.

Rhodosoma, A. G. Butler, Tr. Z. S. ix. p. 534. Allied to *Perigonia*; type, *Macroglossa triopus*, Westw.

Hypodalea, A. G. Butler, Tr. E. Soc. 1877, p. 397. Allied to *Lophura*; type, *H. insignis*, sp. n., l. c. p. 398, pl. ix. figs. 3, 3a, 3b, Sierra Leone.

Goneno, id. Tr. Z. S. ix. p. 543. Allied to *Enyo*, Hübn., and possibly = *Tylognathus*, Feld.; type, *Enyo carinata*, Walk.

Metamimas, id. l. c. p. 582 (= *Cœquosa*, group 2, Walk.). To contain *Sph. australasie*, Don. (type), and *Smer. amboinicus*, Feld.

Eusmerinthus, A. R. Grote, Canad. Ent. ix. p. 132. Type, *Smerinthus geminatus*, Say, but will also include *S. cerisyi*, Kirby, and *cæcus* and *kindermanni*, Ménétr.

Pseudosmerinthus, A. G. Butler, l. c. p. 593. Allied to *Basiana*; type, *B. submarginalis*, Walk.

Tatoglossum, id. l. c. p. 598. Allied to *Anceryx*; type, *Sphinx cariceæ*, Linn.

Apocalypsis, id. l. c. p. 641. Allied to *Euryglottis*; type, *A. velox*, sp. n., l. c., Darjeeling.

Macroglossa orientalis and *lepcha*, A. G. Butler, Tr. Z. S. ix. pp. 528 & 635, Moulmein and Calcutta.

Aleuron butleri, W. F. Kirby, Tr. E. Soc. 1877, p. 240, West Indies.

Diodosida peckoveri, A. G. Butler, l. c. p. 637, Madagascar.

Chorocampus walducki, id. Tr. E. Soc. 1877, p. 398, pl. ix. fig. 2, Australia; *C. indistincta*, id. Ann. N. H. (4) xix. p. 460, Queensland; *C. celata*, id. P. Z. S. 1877, p. 472, Cape York; *C. deserta*, id. Tr. Z. S. ix. p. 638, Australia; *C. tenebrosa*, F. Moore, P. Z. S. 1877, p. 595, S. Andamans; *C. margarita*, Queensland, p. 240, *aspersata* (? = *clotho*, Dru., var.), Andamans, and *johanna*, Brisbane, p. 241; W. F. Kirby, l. c.

Daphnius horsfieldi (= *hypothous*, Walk., nec Cram.), p. 572, Java, and *minima*, p. 573, pl. xcii. fig. 5, South India, A. G. Butler, Tr. Z. S. ix.; *D. magnifica*, id. Ann. N. H. (4) xix. p. 461, Queensland.

Pachylia undatifascia, id. Tr. Z. S. ix. p. 578, Haiti and Brazil.

Ambulyx floralis, id. l. c. p. 639, Darjeeling.

Triptogon andamana, F. Moore, P. Z. S. 1877, p. 595, S. Andamans; *T. piceipennis*, A. G. Butler, Ann. N. H. (4) xx. p. 393, Japan.

Cressonia robinsoni (? = *juglandis*, var.), id. Tr. Z. S. ix. p. 590, New York.

Smerinthus vancouverensis, id. l. c. p. 593, Vancouver's Island, *S. austanti*, O. Staudinger, Pet. Nouv. ii. p. 190, Algeria (? = *S. populi*, var., or *S. populeti*, Bien.).

Daphnusa porphyria, A. G. Butler, l. c. p. 640, Darjeeling.

Acherontia medusa, id. l. c. p. 597, pl. xcii. fig. 10 (larva and pupa only figured), East Indies; *A. sculda*, W. F. Kirby, l. c. p. 242, Borneo.

Calymnia pavonica, F. Moore, P. Z. S. 1877, p. 596, S. Andamans.

Isognathus laura, Venezuela, and *amazonicus* (= *Anceryx scyron*, Walk., nec Cram.), pl. xciv. fig. 8, Villa Nova, A. G. Butler, l. c. p. 601.

Protoparce fulvinotata (= *Macrosila solani*, Walk., pt.), Natal and Ashanti, and *mauritii* (= *M. solani*, ♂ var. β and ♀, Walk.), Mauritius and Natal, p. 606, *jamaicensis*, Jamaica, p. 608, and *orientalis*, East Indies, p. 609, pl. xci. figs. 16 & 17 (larva and pupa only), id. l. c.; *P. lingens*, id. P. Z. S. 1877, p. 169, Madagascar; *P. dalica*, W. F. Kirby, l. c. p. 243, Canada.

Pseudosphinx obscura, A. G. Butler, Tr. Z. S. ix. p. 610, Honduras to Brazil.

Diludia nebulosa (= *Macrosila casuarina*, Walk.), Cape York, and *tranquillaris*, Darjeeling, id. l. c. pp. 615 & 641, *D. chromapteris*, id. P. Z. S. 1877, p. 168, Madagascar, *D. bethia*, W. F. Kirby, l. c. p. 243, Queensland.

Hyleucus caliginus, A. G. Butler, Ann. N. H. (4) xx. p. 393, Japan.

Nephela charoba, Madagascar, and *infernalis*, Ashanti; W. F. Kirby, l. c. pp. 243 & 244.

ÆGERIIDÆ.

Soronia, g. n., F. Moore, Ann. N. H. (4) xx. p. 83. Type, *S. cuprealis*, sp. n., l. c. p. 84, Shanghai.

Ægeria howqua, id. l. c. p. 83, Shanghai.

Sesia polaris, O. Staudinger, S. E. Z. xxxviii. p. 175, Lapland; *S. surinamensis*, H. B. Müschler, Verh. z.-b. Wien, xxvii. p. 631, pl. viii. fig. 1, Paramaribo.

Melitha sangaica and *longipes*, F. Moore, l. c. p. 84, Shanghai.

URANIIDÆ.

A. G. Butler (Ill. Lep. Het. i. pl. i.) figures and redescribes *Nyctalemon excavatus*, p. 58, pl. i. fig. 1, and *Coronis subpicta* and *interlineata*, Walk., p. 59, pl. ii. figs. 2 & 1.

Urania rhipheus, Drury. A. Guénée repeats his former opinion that *rhipheus* of Drury and Cramer are identical. He sinks his *Cydimon cacia* as a var. of *C. fulgens*, and discusses the position of the *Agaristide*; and he instances *Euchelia jacobaea* as an example of a European species of the latter family. Ann. Soc. Ent. Fr. (5) vii. pp. 305-308.

Alcides aurora, sp. n., Salvin & Godman, P. Z. S. 1877, p. 150, pl. xxiii. figs. 5 & 6, Duke of York Island.

Nyctalemon agathyrsus, J. Kirsch, MT, Mus. Dresd. i. p. 129, pl. vii. figs. 8 & 8a, New Guinea; *N. najabula*, F. Moore, P. Z. S. 1877, p. 620, S. Andamans: spp. nn.

CASTNIIDÆ.

J. O. Westwood has published a monograph of *Castnia* and the allied groups, describing and figuring many new species, and numerous details of neururation, &c.; Tr. L. S. (2) i. pp. 155-207, pls. xxix-xxxiii. He refers the following genera to the *Castniidæ*:—*Castnia*, *Orthia*,

Boisd. (*nec* Herr. Schöff., whose type is *augias*, whereas Westwood's type is *pelasgus*), *Synemon*, *Tascina*, g. n., and *Hecatesia*. He excludes *Othria*, g. n. [= *Orthia*, Herr. Schöff.], *Damias*, *Burgena*, *Hespagarista*, and *Rothia*, g. n., as *Agaristidae*; and *Ægiale* and *Megathymus* as *Hesperiidae*. The paper commences with a lengthy discussion on the obstacles to a correct classification of the *Lepidoptera*, with special reference to that of the *Castniidae*, and observations on their neurulation. Westwood rejects Boisduval's sections, regarding only *Castnia pelasgus*, Cram., as worthy of generic separation, and for this (p. 193) he incorrectly retains Herrich-Schäffer's name of *Orthia*, which he thus separates from its type.

Castnia. Westwood, *l. c.* pp. 167-194, remarks on the synonymy of, or figures, the following known species:—*C. schreibersi*, Mikan (= *latreillii*, Godt., = *actor*, Dalm., = *ctesiphon*, Hübn.); *C. cacica*, Herr. Schöff. (*C. procera*, Boisd., may be the male); *C. zerynthia*, Gray (= *langschorfi*, Mén.); *C. icarus*, Cram. (*invaria*, Walk., is a var.); *C. dalmanni*, Gray & Walk., *nec* Boisd., pl. xxx. fig. 5 (♀ = *C. grayi*, Boisd.); *C. pallasia*, Eschsch., pl. xxx. fig. 2 (= *ardalus*, Dalm., = *brecourtii*, Godt.); *C. atymnius*, Dalm. (= *spixi*, Pert., = *futilis*, Walk., and probably not specifically distinct from *C. licus*, Dru.); *C. strigata*, Walk. (= *godarti*, Mén.); *C. papilionaris*, Walk., pl. xxxi. fig. 3; *C. satrapes*, Koll., pl. xxxi. figs. 4 & 5; ♂ *C. phalaris*, Fabr., pl. xxx. fig. 3 (= *subvaria*, Walk.; *dionaea*, Hopff., is a var.); *C. japyx*, Hübn. (= *kirsteni*, Thon., = *fonscolombii*, Godt.); *C. hegemon*, Koll. (= *dalmanni*, Boisd., *nec* Gray); *C. mygdon*, Dalm. (= *phalaris*, Godt., = *mimon*, Hübn., = ? *argus*, Boisd.); *C. evalthe*, Fabr. (= *dardanus*, Cram.; *C. euphrosyne*, Perty, and *virys*, Boisd., are var.); *C. amycus*, Cram., pl. xxx. fig. 4 (*medetrina*, Hopff., may be a var.); *C. huebneri*, Latr. (? = *sternbergi*, Koll.); *C. cronis*, Cram. (= *cronida*, Herr. Schöff.); *C. chremes*, Fabr. (= *nicon*, Hübn., = *thalaira*, Godt., ♀ = *fabricii*, Swains., *teste* Boisd., = *thais*, Dru. & Boisd., = *morphoides*, Walk.); *C. marcelserresi*, Godt. (= *fabricii*, Godt. & Boisd., = *thais*, Walk.); *C. diva*, Butl. (= *tricolor*, Feld.); *C. personata*, Walk. (*simulans*, Boisd., may be a var.); *C. mimica*, Feld., pl. xxxii. fig. 7; *C. linus*, Cram. (*heliconioides*, Herr. Schöff., is a var.); and *C. acrevoides*, Boisd. (= *actinophorus*, Koll.).

Castnia eudesmia, Gray, fig. 2, and *inca*, Walk., fig. 3, pl. i. p. 3, *orestes*, Walk., pl. ii. fig. 2, *zerynthia*, Gray, pl. i. fig. 5, *invaria*, Walk., fig. 4, and *subvaria*, Walk., fig. 1, pl. ii. p. 4, *boisduvali*, Walk., pl. i. fig. 4, *dalmanni*, Gray, fig. 3, and *strigata*, Walk., fig. 5, pl. ii. p. 5, figured and re-described by A. G. Butler, *Ill. Lep. Het. i.*

Synemon, Doubl. J. O. Westwood, *l. c.* pp. 194-198, monographs and re-describes all the species, and figures *S. plana*, Walk., and *hesperioides*, Feld., pl. xxxiii. figs. 6 & 11.

Synemon sophia, White, fig. 6, *leta*, Walk., fig. 4, *theresa*, Doubl., fig. 5, p. 6, *mopsa*, Doubl., fig. 3, and *plana*, Walk., fig. 7, p. 7, figured and re-described by A. G. Butler, *l. c.*

Hecatesia, Boisd., is recharacterized, and referred to the *Castniidae* (p. 199), and *H. fenestrata*, Boisd. (fig. 1), *thyridion*, Feisth., and *excellens*, Walk. (figs. 2 & 3), are re-described (p. 200); J. O. Westwood, *l. c.* pl. xxxiii.

Tascina, g. n., J. O. Westwood, *l. c.* p. 198. Allied to *Castnia*; type, *T. orientalis*, sp. n., *l. c.* p. 199, pl. xxxiii. fig. 5, Singapore.

New species :—

Castnia veraguana, p. 168, pl. xxx. fig. 1, Veragua, *papagaya*, p. 170, pl. xxx. fig. 6, Papagaya, *clitarcha*, p. 176, pl. xxxi. figs. 1 & 2, Panama and Nicaragua, *cononia*, Ecuador, fig. 5, and *cratina*, Amazonia, fig. 4, p. 188, *ecuadoria*, p. 189, fig. 6, Ecuador, *truxilla*, Colombia, fig. 3, and *salvina*, Veragua, fig. 1, p. 190, *cycna*, p. 191, fig. 2, Colombia, pl. xxxii.; J. O. Westwood, *l. c.*

Synemon directa, *nupta*, *obscurilla*, and *notha*, p. 197, *vagans* and *gratiosa*, p. 198, *id. l. c.* pl. xxxiii. figs. 6, 7, 9, 10, 12, & 13.

AGARISTIDÆ.

Agarista lewini, Boisd., p. 7, *affinis*, Boisd., *ephyra*, Walk., *novæ-hiberniæ*, Boisd., *leonora*, Doubl., p. 8, *donovani*, Boisd., and *milete*, Cram. (= *melite*, Walk.), p. 9, figured and redescribed by A. G. Butler, Ill. Lep. Het. i. pl. iv. figs. 2-7, pl. v. fig. 6.

Eusemia. A. G. Butler, *l. c.*, describes and figures the following species of Walker: *E. basalis*, p. 9, *pallida*, *longipennis*, *contigua*, and *promima*, p. 10, pl. v. figs. 2, 3, 5, pl. iv. figs. 8 & 9.

Burgena transducta, Walk., = *Damias varia*, Walk., J. O. Westwood, *l. c.* p. 203; *B. varia* is figured and redescribed by A. G. Butler, *l. c.* p. 11, pl. iv. fig. 1.

Ægocera bimacula, Walk., and *latreillii*, Herr. Schöff. (= *magna*, Walk.), p. 11, and *fervida*, Walk., p. 12, figured and redescribed by A. G. Butler, Ill. Lep. Het. i. pl. v. figs. 4, 8, & 1.

Metagarista triphcenoides, Walk., figured and redescribed, *id. l. c.* p. 12, pl. v. fig. 7.

Celerena lerne, Boisd., and *mutata*, Walk. Structure described and hind tibiæ figured by J. Kirsch, MT. Mus. Dresd. i. p. 132. The latter is redescribed and figured, *l. c.* p. 132, pl. vii. fig. 7.

New genera and species :—

Othria, J. O. Westwood, Tr. L. S. (2) i. p. 201. Allied to *Ægocera*; to include *Orthia angias*, Herr. Schöff. [which is the type of *Orthia*, and that name must be retained for this genus], *nexa*, Boisd., *lindigi*, *doleschalli*, *semperi*, *moori*, *alethe*, and *batesi*, Feld., *amalthæa*, Dalm., and *O. amazonica*, Amazonia, *columbina* [= *colombiana*], Colombia, and *ecuadorina*, Ecuador, p. 202.

Rothia, Westwood, *l. c.* p. 205. Allied to *Hespagarista*; to include *Agarista pales*, Boisd., *eriotis*, *agrius*, and *pedasus*, Herr. Schöff., and *R. simyra*, *ibid.*, Madagascar.

Eusemia longipalpis and *melanvra*, J. Kirsch, MT. Mus. Dresd. i. p. 130, pl. vii. figs. 12 & 3, New Guinea.

Baputa dichroa, *id. l. c.* p. 131, pl. vii. fig. 5, New Guinea.

Seudhyra subflava, F. Moore, Ann. N. H. (4) xx. p. 85, Chekiang.

Phagorista fumosa, A. G. Butler, *op. cit.* xix. p. 461, Lake Nyassa.

ZYGÆNIDÆ.

A. G. Butler (Ill. Lep. Het. i.) figures and describes the following known species of *Zygænidae* (Walker's, when not otherwise specified):—*Anteris ampla*, p. 12, pl. vi. fig. 12, *Northia cyaneacula*, Herr. Schöff. (*nigrigemma*, Walk.), pl. vii. fig. 8, *Procris trimacula*, pl. vi. fig. 8, *tricolor*, pl. vi. fig. 6, *stipata*, pl. vii. fig. 9, p. 13, *dolens*, *pusilla*, and *apicalis*, p. 14, pl. vi. figs. 4, 1, & 2, *Pollanisus sequens*, p. 14, *rufiventris* and *cupreus*, p. 15, pl. vi. figs. 3, 7, & 5, *Neurosymploca contraria*, p. 15, pl. vii. fig. 4; *Syntomis nostalis*, p. 15, *kuhlweini*, Lef. (= *simplex*, Walk.), *marginalis* and *divisa*, p. 16, and *melas*, p. 17, pl. vi. figs. 11, 17, 13, 14, & 10, *fulvosoma* [!] (= *thyretiformis*, Wallengr.), pl. vii. fig. 2, *pectoralis*, pl. vi. fig. 15, *terminalis*, pl. viii. fig. 1, p. 17, *alhimacula* and *fervida*, p. 18, pl. vi. figs. 9 & 16; *Melisa connexa* and *diptera*, pp. 18 & 19, pl. viii. fig. 1, and pl. ix. fig. 10; *Hydrusa bicolor* and *multigutta*, p. 19, pl. ix. fig. 1, pl. vii. fig. 3; *Thyrassia subcordata*, p. 19, pl. vii. fig. 5; *Phacusa tenebrosa*, p. 20, pl. xii. fig. 1; *Phanda flammanis* and *fortunii*, Herr. Schöff. (= *triadum*, Walk.), p. 20, pl. ix. figs. 2 & 3; *Histiaca bellatrix*, p. 20, pl. viii. fig. 8, *amazonica*, Butl., and *uranophila*, p. 21, pl. xviii. figs. 1 & 2; *Euchromia leonis*, Butl., and *semiluna*, p. 22, pl. x. fig. 2, pl. ix. fig. 8; *Eurata picta*, Herr. Schöff. (= *pictula*, Walk.), p. 22, pl. xi. fig. 14; *Syntomeida ferox* (= *eutrope*, Herr. Schöff.), *epitais* and *tina* (= *Sphenoptera batesi*, Feld.), p. 23, pl. x. fig. 7, pl. viii. figs. 5 & 9; *Euprya ignita*, Herr. Schöff., and *plebeia*, Herr. Schöff. (= *opulenta*, Walk.), pp. 23 & 24, pl. x. figs. 8 & 5; *Trichela toluimensis*, Herr. Schöff. (= *hirsuta*, Walk.), p. 24, pl. xiii. fig. 10; *Psoloptera thoracica*, p. 24, pl. viii. fig. 6; *Ichoria quadrigutta*, p. 25, pl. x. fig. 1; *Macrocneme auripes* (*duripes* on plate), p. 25, pl. viii. fig. 4; *Callicarus plumipes*, Dru., p. 25, pl. viii. fig. 2; *Orcynia calcarata*, p. 26, pl. ix. fig. 10; *Isanthrene pompiloides*, p. 26, pl. xii. fig. 10; *Homocera scintillans*, Herr. Schöff. (= *flavitaris*, Walk.), p. 26, *gemmifera* and *salvini*, Butl., p. 27, pl. xii. figs. 4 & 12, pl. xvii. fig. 4; *Sarosa sesiiiformis*, p. 27, pl. xii. fig. 5; *Erruca deyrollii*, Herr. Schaff., p. 28, pl. xii. fig. 6; *Myrmecopsis tarsalis* and *semihyalina* (= *vespiformis*, Herr. Schöff.), p. 28, pl. xiii. figs. 1 & 9; *Gymnelia lennus* and *completa*, pp. 28 & 29, pl. xii. figs. 8 & 3; *Lamocharis trigutta*, p. 29, pl. vii. fig. 10; *Thrinacia afflicta*, p. 29, pl. vii. fig. 12; *Pseudomyia tipulina*, Hübn. (= *tibiae*, Walk.), p. 29, pl. vii. fig. 7; *Pheia albisigna*, *gemmata*, Butl., and *intensa*, p. 30, pl. vii. fig. 14, pl. xvii. fig. 5, pl. xii. fig. 11; *Cosmosoma panopes*, Herr. Schöff. (= *subflamma*, Walk.), *centralis*, and *teuthras*, p. 31, pl. xii. fig. 9, pl. xi. fig. 9, and pl. xiii. fig. 5; *Ilipa braconoides*, p. 32, pl. xi. fig. 15; *Leucotomis latilinea*, p. 32, pl. xi. fig. 10; *Dychadia varipes* and *picta*, p. 32, *bura*, Herr. Schöff. (= *discifera*, Walk.), and *dorsalis*, p. 33, and *tedu*, p. 34, pl. xi. figs. 5, 4, 12, 6, & 1; *Marissa columbina*, Fabr. (= *multicincta*, ♀, Walk.), and *multicincta*, pp. 34 & 35, pl. xi. figs. 3 & 11; *Hysia melaleuca*, p. 35, pl. xi. fig. 2; *Desmidocnemis platyleuca*, p. 35, pl. xiii. fig. 2; *Hyda xanthorrhina*, Herr. Schöff. (= *basilutea*, Walk.) p. 35, pl. xi. fig. 8; *Methysia notabilis*, p. 36, pl. vii. fig. 11; *Muliodeta weyra*, Herr. Schöff. (= *sortita*, Walk.), p. 36, pl. xiii. fig. 6; *Lagaria vulnerata*, Herr. Schöff. (= *erythrarchus*, Walk.), p. 36, pl. xii. fig. 2; *Hyela sanguinea*

and *stipata*, pp. 37 & 38, pl. xi. fig. 13, and pl. xiii. fig. 8; *Eanomia andromacha*, Fabr. (= *finalis*, Walk.), p. 38, pl. xiii. fig. 3; *Trichura latifascia* and *esmeralda*, pp. 38 & 39, pl. xi. fig. 7, and pl. xiii. fig. 11; *Herea metaxanthus* and *ruficeps*, p. 39, pl. xii. fig. 7, and pl. xiii. fig. 4; *Mallostethus metamelas*, p. 39, pl. vii. fig. 10; *Procalypta subcyanea*, p. 40, pl. viii. fig. 11; and *Antichloris anthracina*, p. 40, pl. ix. fig. 7.

Ino geryon, Hübn., a yellow var. of *Zygæna hippocrepidis*, Hübn., and various varr. of *Z. carniolica*, Scop., noticed by A. Fuchs, S. E. Z. xxxviii. pp. 135-138.

Leucocharis albifrons and *Chrysostola splendens*, Möschl., = *Panopes diaphana*, Sepp., and *Dycladia picta*, Walk., respectively; H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 636.

Echeta albipennis and *Glaucopis selecta*, Herr. Schöff. Varieties described; H. Dewitz, MT. Münch. ent. Ver. i. pp. 94-96.

Zygæna filipendule. Note on the yellow variety; S. D. Bairstow, Ent. x. pp. 73 & 74. A specimen with one hind leg replaced by a fifth wing; N. M. Richardson, Nature, xvi. p. 361. *Z. trifolii*: its variation, and relationship to the allied species, discussed by A. Speyer, S. E. Z. xxxviii. pp. 40-51. He describes and figures var. *trivittata*, p. 42, fig. a.

Xenares, Herr. Schöff. (= *Phauda*, Walk.), is referred to the *Zygænidæ*; P. C. T. Snellen, Tijdschr. Ent. xx. pp. 4 & 5.

New genera and species:—

Colletria, Nolcken & Zeller, Hor. Ent. Ross. xii. p. 76. Differs from *Ino* and allies in wanting ocelli; type, *C. pyrrhocrocis*, Feld. & Rog., described and refigured from Bogota, l. c. p. 80, pl. iii.

Pryeria, F. Moore, Ann. N. H. (4) xx. p. 85. Allied to *Phauda*; type, *P. sinica*, sp. n., l. c. p. 86, Shanghai.

Schasiura, A. G. Butler, Ill. Lep. Het. i. p. 37. Allied to *Gymnelia*; type, *S. mimica*, sp. n., l. c. pl. xvi. fig. 6, Upper Amazon.

Zygæna cacuminum, H. Christoph, Hor. Ent. Ross. xii. p. 243, pl. vi. fig. 17, Schahkuh; *Z. niphona*, A. G. Butler, Ann. N. H. (4) xx. p. 393, Japan.

Procris esmeralda, id. l. c. p. 394, Japan.

Northia tenuis, id. l. c., Japan.

Syntomis caspia, O. Staudinger, S. E. Z. xxxviii. p. 176, Astrachan; *S. constricta* (= *terminalis*, Walk., var.), A. G. Butler, Ill. Lep. Het. i. p. 18, pl. vii. fig. 6, Congo.

Eressa affinis, F. Moore, P. Z. S. 1877, p. 196, pl. lix. fig. 3, S. Audamans and India.

Tascia pulchra, A. G. Butler (= *Euchromia finalis*, Walk., pt.), Ill. Lep. Het. i. p. 20, pl. x, fig. 3, Congo.

Euchromia æmulina, id. P. Z. S. 1877, p. 473, Cape York.

Phacusa thoracica, F. Moore, Ann. N. H. (4) xx. p. 343, Ceylon.

Sphecosoma angustata [-tum], H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 634, pl. viii. fig. 2, Surinam.

Pseudomyia tenuis, A. G. Butler, Ill. Lep. Het. i. p. 30, pl. xvii. fig. 1, Rio Trombetas.

Cosmosoma melitta and *nelea*, H. B. Möschler, *l. c.* p. 635, pl. viii. figs. 3 & 4, Surinam.

Dycladia militaris, Amazons, and *lacteata*, Rio Jutahi, A. G. Butler, *l. c.* pp. 33 & 34, pl. xvi. fig. 1, & pl. xvii. fig. 3.

Murissa parnassia, p. 636, *gracilis* and *vesta*, p. 637, H. B. Möschler, *l. c.* pl. viii. figs. 5-7, Surinam.

Hyela astrifera, A. G. Butler, *l. c.* p. 38, pl. xvii. fig. 2, Rio Javary.

Eunomia pennata, H. B. Möschler, *l. c.* p. 638, pl. viii. fig. 8, Surinam.

Echeta flavicollis, H. Dewitz, MT. Münch. ent. Ver. i. p. 94, Porto Rico.

Trichura ismene, H. B. Möschler, *l. c.* p. 639, pl. viii. fig. 9, Surinam.

Ceramidia obscura, A. G. Butler, *l. c.* p. 40, pl. xvi. fig. 5, Rio Purus.

Antichloris phemonoides, H. B. Möschler, *l. c.* p. 639, pl. viii. figs. 10 & 10a, Surinam.

Eriphia surinamensis and *butleri*, id. *l. c.* p. 640, pl. viii. figs. 11, 11a, 12, & 12a, Surinam.

ARCTIIDÆ.

The following known species of *Arctiidae* (Walker's, when not otherwise specified) are figured and redescribed by A. G. Butler, Ill. Lep. Het. i. :—*Aclytia halys*, Cram. (*heber*, Walk.), and *flavigutta*, p. 41, pl. x. fig. 6, & pl. viii. fig. 3; *Charidea submacula*, p. 41, pl. xiii. fig. 7, *arrogans*, pl. xiii. fig. 12, *alonzo*, Butl. (*fastuosa*, var. Walk., pl. x. fig. 11, *hurama*, Butl., pl. xviii. fig. 8, p. 42, and *gloriosa*, p. 43, pl. x. fig. 10; *Metriophyla apicalis*, Herr. Schöff. (*albiplaga*, Walk.), p. 43, pl. viii. fig. 7; *Helitura solicauda*, Butl. (*tetragramma*, var. Walk.), p. 44, pl. ix. fig. 4; *Acridopsis marica*, Cram. (*grylloides*, p. Walk.), p. 45, pl. ix. fig. 6; *Automolis contraria*, p. 45, pl. ix. fig. 9, *ameoides*, Butl., and *fulgurata*, Butl., p. 46, pl. xviii. figs. 4 & 5; *Pionia lycoides*, p. 47, pl. viii. fig. 10; *Pompostola vicaria*, p. 47, pl. x. fig. 4; *Rhipha strigosa* (*Eucyrtu subulifera*, Feld., var. ?), p. 47, pl. ix. fig. 12; *Androcharta diversipennis* and *stretchi*, Butl., p. 48, pl. x. fig. 9, & pl. xviii. fig. 7; *Eucereon varium*, Walk., p. 49, pl. ix. fig. 5; *Hyaleuceria erythrotelus*, p. 51, pl. vii. fig. 13; *Phæoptera rhodosoma*, Butl., p. 52, pl. xviii. fig. 3; *Anacita sannionis*, Butl., p. 53, pl. xviii. fig. 6; and *Eucyane diana*, Butl., p. 53, pl. xix. fig. 6.

Epanycles stellifera, Butl., = *Aclytia obscura*, Möschl.; H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 645.

Charidea splendida, Herr. Schöff., and *eucyane*, Feld., = *C. argentiflua*, Esp.; id. *l. c.* p. 611.

Pseuderbessa quadrimaculata, Möschler, figured; id. *l. c.* pl. ix. fig. 24. *Eucereon arenosum*, Butl. ? and *E. ? pilatii*, Walk., redescribed and the latter figured; id. *l. c.* pp. 648 & 649, pl. viii. fig. 17.

Halesidota agassizi, Pack. H. Edwards describes var. *alni* of the larva; P. Cal. Ac. vi. H. *rhomboides* and *pellucida*, Sepp, redescribed by H. B. Möschler, *l. c.* pp. 667 & 668.

Ocnogyna parasita, Hübn. Transformations figured and described by P. Millière, Icon. iii. pp. 417 & 418, pl. cli. figs. 14-16. *O. corsica*, Ramb.,

var. *sardoa*, Staud., noticed and figured, *id. l. c.* pp. 391 & 392, pl. cxlix. figs. 3-5. *Bombyx deserticola*, Berg, belongs to this genus; C. Berg, Bull. Mosc. lii. p. 13.

Chelonia spectabilis, Tausch. Larva described, and figured, with the imago, by P. Millière, Icon. iii. pp. 180 & 181, pl. cxviii. figs. 7 & 8. *C. caia*: larva attacked by muscardine; Girard & Xamheu, Bull. Soc. Ent. Fr. vii. pl. lxx.

Spilosoma sordidum, Hübn., noticed and figured by P. Millière, Icon. iii. pp. 279 & 280, pl. cxxxiv. fig. 1.

Euchætes collaris, Fitch. Transformations described; Van Wagenen & Lintner, Canad. Ent. ix. pp. 170 & 171. *E. spraguui*, A. R. Grote; ♀ noticed by him, *tom. cit.* p. 85.

[*Palustra* ?] Description and habits of a new aquatic larva from Uruguay; C. Berg, Ann. Soc. Ent. Fr. (5) vii. pp. 183-188.

New genera and species:—

Metriophyla, A. G. Butler, Ill. Lep. Het. i. p. 43. Allied to *Heliura*, type, *Charidea apicalis*, Herr. Schöff. (= *Euchromia albiplaga*, Walk.), figured and redescribed by Butler, *l. c.* pl. viii. fig. 7. *Sphinx porphyria*, Cram., and *Diopsis glaucopoides*, Walk., may also be referred to this genus.

Pseudeuceron, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 652. Allied to *Euceron*; type, *Phalena eleuthera*, Cram.

Sychesia, *id. l. c.* p. 653. Allied to last; type, *S. fimbria*, sp. n., *l. c.* p. 654, pl. ix. fig. 22, Surinam.

Tricyptha, *id. l. c.* p. 654. Allied to last; type, *T. furcata*, sp. n., *l. c.* pl. ix. figs. 23 & 23 a, Surinam.

Episcepsis, A. G. Butler, *l. c.* p. 49. Allied to *Scepsis*; type, *E. venata*, sp. n., *l. c.* pl. xvi. fig. 7, Rio Jutahi.

Hoplarctia, *id. l. c.* p. 54. Allied to *Heraclea*; type, *Ammalo nantana*, Walk., figured and redescribed, *l. c.* pl. xix. fig. 2.

Chlanidophora, C. Berg, Bull. Mosc. lii. p. 9, & An. Soc. Argent. iv. p. 95. Allied to *Euprepia* and *Arctia*; type, *C. patagiata*, sp. n., *ll. cc.* pp. 11 & 96, Patagonia.

Thanatarctia, A. G. Butler, Ann. N. H. (4) xx. pp. 395. Allied to *Phragmatobia*; type, *T. infernalis*, sp. n., *l. c.*, Japan.

Rhypparioides, *id. ibid.* Allied to *Rhypparia* and *Diacrisia*; type, *R. nebulosa*, sp. n., *l. c.* p. 396, Japan.

Heliura gnoma, Rio Padaniry, and *lamia*, Rio Mauches and Rio Purus, A. G. Butler, Ill. Lep. Het. i. p. 44, pl. xvi. figs. 2 & 3; *H. luctuosa*, H. B. Möschler, *l. c.* p. 642, pl. viii. fig. 13, Paramaribo.

Acridopsis thysbe, p. 643, pl. viii. fig. 14, and *virescens*, p. 644, pl. x. fig. 53, Surinam, *id. l. c.*

Telioneura brevipennis, A. G. Butler, *l. c.* p. 45, pl. xvi. fig. 9, Rio Purus.

Cretonotus continuatus, F. Moore, Ann. N. H. (4) xx. p. 344, Ceylon.

Automolis zenzeroides, A. G. Butler, *l. c.* p. 46, pl. xvi. fig. 8, Rio Purus.

Epanycles stellifera, *id. l. c.* p. 48, pl. xvi. fig. 10, Rio Jutahi.

- Sciopsyche bractea*, H. B. Möschler, *l. c.* p. 645, pl. viii. fig. 15, Surinam.
- Scepsis trifasciata*, A. G. Butler, *l. c.* p. 49, pl. xvi. fig. 11, Rio Purus.
- Eucereon marmoratum* and *complicatum*, Rio Jurua, *reticulatum*, Rio Jutahi, p. 50, and *arenosum*, Rio Madeira, p. 51, *id. l. c.* pl. xvi. figs. 4 & 12, & pl. xvii. figs. 9 & 10; *Eucereon aoris*, *lutulentum*, *minutum*, and *flavofusciatum*, H. B. Möschler, *l. c.* pp. 647, 650, & 651, pl. viii. figs. 16 & 18, & pl. ix. figs. 19 & 20, Surinam.
- Neritos obscurata*, A. G. Butler, *l. c.* p. 51, pl. xvii. fig. 6, Prainha.
- Malabus lateritius*, H. B. Möschler, *l. c.* p. 653, pl. ix. fig. 21, Paramaribo.
- Elysium optimum*, A. G. Butler, *l. c.* p. 51, pl. xvii. fig. 8, Rio Jurua.
- Zatrapes traili*, Rio Jurua, and *paradisea*, Rio Jutahi, *id. l. c.* p. 52, pl. xvii. figs. 7 & 11.
- Hyalurga modesta* and *transita*, H. B. Möschler, Verh. z.-b. Wien, xxvii. pp. 663 & 664, pl. ix. figs. 29 & 30, Surinam.
- Milionia lysistrata*, J. Kirsch, MT. Mus. Dresd. i. p. 131, pl. vii. fig. 4, New Guinea.
- Halisidota testacea* and *sobrina*, H. B. Möschler, *l. c.* p. 668, pl. ix. figs. 32 & 33; *H. bimaculata*, H. Dewitz, MT. Münch. ent. Ver. i. p. 95, Porto Rico.
- Spilarectia imparilis* and *mollicula*, A. G. Butler, Ann. N. H. (4) xx. pp. 394 & 395, Japan.
- Spilosoma mandarina*[num-] and *howqua*, p. 88, *erubescens*, p. 89, F. tom. cit., Shanghai.
- Alpenus flammeolus*, *id. l. c.*, Chekiang; *A. biserialus*, *id. P. Z. S.* 1877, p. 296, S. Andamans.
- Heraclea commista*, A. G. Butler, Ill. Lep. Het. i. p. 54, pl. xix. fig. 1, Guatemala.
- Euprepia pheosoma*, *id. Ann. N. H.* (4) xx. p. 395, Japan.
- Palustra azollæ* and *tenuis*, C. Berg, S. E. Z. xxxviii. pp. 258 & 259; Ann. Soc. Ent. Fr. (5) vii. pp. 191 & 193, Buenos Aires (with description of the transformations of the former).

LITHOSIIDÆ.

A list of the *Lithosiidae* in the collection of the British Museum, with descriptions of many new species, and numerous corrections of synonymy, is published by A. G. Butler, Tr. E. Soc. 1877, pp. 325-377, pl. viii. (chiefly representing the neurulation of various genera and species). *Ituna*, Walk. (*nec* Doubl.), is renamed *Tuina*, p. 326, and *Ruscino menea*, Walk. (*nec* Dru.), is renamed *artifascia*, p. 330.

Bizone puella, Dru. Pupa described, P. C. T. Snellen, Tijdschr. Ent. xx. pp. 7 & 8.

Barsine natalensis, Walk., redescribed; A. G. Butler, *l. c.* p. 341.

Dianasa suffusa, Walk., var. *obscura* from Australia described; *id. l. c.* p. 346.

Lithosia molybdeola. Larva described; P. H. Jennings, Ent. x. pp. 46 & 47.

Themiscyra varicosa, Butl., = (*Mieza*) *mactata*, Feld., A. G. Butler, *l. c.* pp. 473 & 474.

Deiopia ornatrix, Linn., var. *stretchi*, Honduras, and *hybrida*, United States, *bella*, Linn., var. *intermedia*, United States, and *pulchella*, Linn., var. *candida* from S. Africa noticed; A. G. Butler, *l. c.* p. 361. He also (*l. c.* p. 87) notices a var. of *D. ornatrix* from the Galapagos Islands. *D. pulchella*, Linn., a var. from Java, with the red markings replaced with yellow, noticed by P. C. T. Snellen, Tijdschr. Ent. xx. p. 8.

Spiris striata, Linn., var. *pallida*, from Europe, described by A. G. Butler, *l. c.* p. 360.

Emene guttularis, Walk., redescribed: *id. l. c.* p. 373.

Eudmoe (Hübner) *arne*, Cram., = *delumbis*, Herr. Schöff. Genus and species recharacterized by H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 661.

Nola. The larvæ of several species feed on flowers, and not on lichens; P. Millière, Icon. iii. p. 408, note. *N. squalida*, Staud., redescribed and figured, *id. l. c.* pp. 407 & 408, pl. cl. figs. 15 & 16.

Argyrophys cilicoides, Grote. Amended descriptions of both species and genus. *Eustrotia obaurata*, Morrison, = *Nola nigro-fusciata*, Zell., and is closely allied to *cilicoides*; A. R. Grote, Canad. Ent. ix. pp. 236-238.

• *New genera and species* :—

Campylona, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 658. Allied to *Phæochlæna*, &c.; type, *C. bicolor*, sp. n., *l. c.* p. 659, pl. ix. figs. 27 & 27 a, Surinam.

Eudoliche, *id. l. c.* p. 660. Allied to *Doliche*; type, *E. vittata*, sp. n., *l. c.* pl. ix. fig. 28, Surinam.*

Pseudapistosia, *id. l. c.* p. 665. Allied to *Apistosia*; type, *Phalæna umber*, Cram.

Senia, *id. l. c.* p. 666. Allied to last; type, *Phalæna astur*, Cram.

Callatolmis, A. G. Butler, Tr. E. Soc. 1877, p. 348. Allied to *Atolmis*; type, *Lycomorpha coleoprata*, Walk. (*Atychia* ? *diabolus*, Feld., may be a second species).

Epatolmis, *id. l. c.* Allied to *Clelea*; type, *Atolmis japonica*, Walk.

Chrysægla, *id. l. c.* p. 356. Allied to *Lithosia* and *Crambomorpha*; type, *Lithosia magnifica*, Walk.

Chrysorabdia, *id. l. c.* p. 357. Allied to last; type, *Lithosia viridata*, Walk.

Calamidia, *id. l. c.* p. 358. Allied to *Chrysægla* and *Areva*; type, *Lithosia hirta*, Walk.

Tigrioides, *id. l. c.* p. 359. Allied to *Lithosia*; type, *Setina alterna*, Walk.

Tatargina, *id. l. c.* p. 366. Allied to *Argina*; to contain *Deiopia picta*, Walk. (type), and *T. formosa*, sp. n., *l. c.*, South China.

Leptidule, *id. l. c.* p. 368. Allied to *Eudule*; to contain *Ameria integra*, Walk., and *L. sordida*, sp. n., *l. c.* p. 369, Santa Martha.

Stenelopsis, *id. l. c.* p. 375. Allied to *Zerenopsis*, but with a superficial resemblance to *Stenele*; type, *S. exposita*, sp. n., *l. c.*, Para.

Pteroodes, *id. l. c.* p. 376. Allied to *Petovia*; type, *Lithosia longipennis*, Walk.

Melanæma, *id. Ann. N. H.* (4) xx. p. 397. Allied to *Miltochrista*; type, *M. venata*, sp. n., *l. c.* Japan.

Psychogoes, Butler, *l. c.* p. 400. Allied to *Secusio*; type, *P. aterrima*, sp. n., *l. c.*, Japan.

Cisthene minuta, id. Tr. E. Soc. 1877, p. 327, Santa Martha.

Trichromia suspecta, id. *l. c.* p. 328, Espiritu Santo.

Mapha plicata and *sesapina*, id. *l. c.* pp. 328 & 329, Espiritu Santo.

Talara coccinea, id. *l. c.* p. 329, Villa Nova.

Brachyglene uniformis, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 657, pl. ix. fig. 25, Surinam.

Phaeochlana oblecta, id. *l. c.* fig. 26, Surinam.

Josioides fallax, Brazil, and *variana* (Walk., MS.), Para, p. 331, *inde-cisa*, *inconstans*, and *obscura*, Para, p. 332; A. G. Butler, Tr. E. Soc. 1877. *J. sex-maculata*, Pará, and *purpurata*, Upper Amazon; id. Ill. Lep. Het. i. pp. 54 & 55, pl. xix. figs. 4 & 5.

Pallene elegans and *gracilis*, id. Tr. E. Soc. 1877, pp. 334 & 376, Australia.

Eutane maculata, id. *l. c.* p. 335, Australia.

Tigridoptera rotundata, id. Ent. M. M. xiv. p. 108, Queensland.

Eudule unicolor (Herr. Schöff., MS. ?), H. B. Möschler, *l. c.* p. 660, Surinam, Chiriqui; *E. weyenberghi*, P. C. T. Snellen, Bol. Ac. Cordova, ii., Cordova.

Nepita ochracea, S. India, and *limbata*, N. India, A. G. Butler, Tr. E. Soc. 1877, p. 336.

Bizone javanica (= *puella*, Moore, *nec* Dru.), *pallens*, N. India, and *per-versa*, Sarawak; A. G. Butler, *l. c.* p. 338. *B. amabilis*, F. Moore, P. Z. S. 1877, p. 597, pl. lix. fig. 2, S. Andamans.

Barsine mactans, Darjeeling, and *exclusa*, Sarawak, A. G. Butler, *l. c.* p. 340. *B. trivittata*, F. Moore, *l. c.* p. 597, S. Andamans.

Ammatho roseo-roratus, Sarawak, p. 341, *carnipicta*, Mongolia, p. 342, *fuscescens*, Mongolia and Shanghai, and *hieroglyphica*, Sarawak, p. 343, A. G. Butler, *l. c.*

Hypocrita inclusa, P. C. T. Snellen, Tijdschr. Ent. xx. p. 68, pl. v. figs. 2 a-c, Sumatra (= *Ammatho eupre pioides*, Walk., *teste* A. G. Butler, Tr. E. Soc. 1877, p. 343); *H. calochroma*, Snellen, Bol. Ac. Cordova, ii., Cordova.

Sesapa complicata, Sarawak, p. 344, *ichorina*, Natal, and *erubescens*, North China, p. 345, A. G. Butler, Tr. E. Soc. 1877; *S. andamana*, F. Moore, P. Z. S. 1877, p. 597, S. Andamans.

Mitochrista pulchra and *calamina*, p. 396, *aberrans* and *rosaria*, p. 397, A. G. Butler, Ann. N. H. (4) xx., Japan; *M. decussata* and *sinica*, F. Moore, *tom. cit.* p. 87, Shanghai.

Dymphlebia elegans, Abyssinia, and *tricolora*, Aru Islands; A. G. Butler, Tr. E. Soc. 1877, p. 347.

Lithosia fraterna, Tasmania, p. 349, *sarawaca*, p. 350, and *decreta*, p. 351, Sarawak, *immutata* (Walk., MS. ?), p. 352, *kingdoni*, Madagascar, and *L. (?) puncticollis*, Sarawak, p. 353, id. *l. c.*; *L. agrotæ*, p. 397, *adaucta*, *pavescens*, and *levis*, p. 398, id. Ann. N. H. (4) xx., Japan; *L. alba*, F. Moore, *op. cit.* p. 87, Shanghai; *L. chilomorpha*, P. C. T. Snellen, Tijdschr. Ent. xx. p. 67, pl. v. figs. 1a-d, Sumatra.

Teulisia biplagella (Walk., MS.), and *oblonga*, Sarawak, and *bertha*, Java, A. G. Butler, Tr. E. Soc. 1877, p. 355.

Æonistis dives, id. Ann. N. H. (4) xx. p. 398, Japan.

Crambomorpha splendens, id. Tr. E. Soc. 1877, p. 357, Bombay.

Stenoplastis venata, id. l. c. p. 359, Espiritu Santo.

Deiopia pura (= *ornatrix*, var. ?), South and Central America, and *thyter*, Turkey, Punjab, id. l. c. pp. 360 & 361.

Digama fasciata, Ceylon, and *marmorea*, N. Australia, id. l. c. pp. 362 & 363.

Argina notata, id. l. c. p. 365, N. India.

Eudule sanguinea, id. l. c. p. 368, Para ?.

Setina accepta, id. l. c. p. 369, Sarawak; *S. albo-sericea*, F. Moore, Ann. N. H. (4) xx. p. 87, Shanghai.

Setinochroa sanguinea, id. l. c. Shanghai.

Æmene fasciata, A. G. Butler, Ann. N. S. (4) xx. p. 399, Japan; *Æ. sordida*, id. Tr. E. Soc. 1877, p. 372, S. India.

Nola sezmaculata, A. R. Grote, Canad. Ent. ix. p. 235, Canada; *N. ? dardoinula*, P. Millière, Icon. iii. p. 172, pl. cxvii. figs. 1 & 2, Marseilles.

Eugoa grisea, A. G. Butler, Ann. N. H. (4) xx. p. 399, Japan.

NYCTEOLIDÆ.

Earias chlorana. Transformations described; W. Buckler, Ent. M. M. xiv. pp. 42 & 43.

MELAMERIDÆ.

Cleis, Guér., is revised by A. G. Butler, Ann. N. H. (4) xix. pp. 393–396, who refers to it *dichroa*, Boisd., *evander*, Cram., *plagalis*, *erycinoides*, and *versicolor*, Feld., and *posticalis*, Guér. (= *melaxanthe*, Boisd.).

A. G. Butler (l. c. p. 396) remarks concerning allied genera that *Agonis lycenoides*, Feld., appears to be a slightly aberrant form of *Cleosiris*, to which genus the following species are referable: *C. erycinoides*, Walk., *anchora*, *felderi*, and *catamita*. The allied genus *Callidula* contains *C. petavius*, *abisara*, *sakuni*, and *jucunda*; and *Tyndaris* contains *T. erycinata* (the male of which is figured by Felder as that of his *T. letifica*) and *T. letifica*. *Damias elegans*, Boisd., appears to be congeneric with *Nyctemera ulspersa*, Walk., to which the name *Damias* may be provisionally restricted.

New genera and species:—

Pterodecta, A. G. Butler, l. c. p. 399. Allied to *Cleosiris*; to include *C. anchora* (type), and *C. felderi*; and *P. gloriosa*, sp. n., l. c., Japan.

Pechiosea, id. l. c. xx. p. 128. Allied to *Micropus*; type, *Phalæna flavelata*, Cram.

Cleis arctata, Ké Island, and *propinqua*, Ternate and Celebes, p. 394, *fasciata*, Ternate, and *aruana*, Aru, p. 395, A. G. Butler, Ann. N. H. (4) xix.; *C. externa*, Anus, and *plioxantha*, Mysore Island, J. Kirsch, MT. Mus. Dresd. i. p. 130, pl. vii. figs. 1 & 2.

Lama striata, A. G. Butler, Ill. Lep. Het. i. p. 55, pl. xix. fig. 7, Espiritu Santo.

Gangamela figulina, id. l. c. fig. 8, Espiritu Santo.

DIOPTIDÆ.

Hyrmiæa berea, p. 664, pl. ix. fig. 31, and *fatima*, p. 665, H. B. Möschler, Verh. z.-b. Wien, xxvii., Surinam; *H. traili*, A. G. Butler, Ill. Lep. Het. i. p. 56, pl. xix. fig. 9, Amazons: spp. nn.

Stenele calida, sp. n., id. l. c. fig. 3, East Peru.

NYOTEMERIDÆ.

Pterothysanus laticilia, Walk., figured and redescribed by A. G. Butler, Ill. Lep. Het. i. p. 56, pl. xiv. fig. 2, Silhet.

Leptosoma annulatum, Boisd., is referred to *Secusio*; id. P. Z. S. 1877, p. 380.

Melania punctigera, Feld., described by P. C. T. Snellen, Tijdschr. Ent. xx. pp. 6 & 7.

Dondera, g. n., F. Moore, Ann. N. H. (4) xx. p. 344. Allied to *Nyctemera*; type, *D. alba*, sp. n., l. c., Ceylon.

Pitasila, id. P. Z. S. 1877, p. 599; type, *P. leucospilota*, sp. n., l. c. pl. lix. fig. 7, S. Andamans.

HYPSIDÆ.

Hypsa albifera, Feld. (= *plana*, Feld.), and *carica*, Fabr. (= *alciphron*, Moore), larvæ described; P. C. T. Snellen, Tijdschr. Ent. xx. pp. 5 & 6.

Philona cinerascens, sp. n., F. Moore, P. Z. S. 1877, p. 598, pl. lix. fig. 6, S. Andamans.

Hypsa andamana, pl. lix, fig. 5, and *venalba*, id. l. c., S. Andamans; *H. zebrina*, A. G. Butler, op. cit. p. 815, Formosa: spp. nn.

CHALCOSIIDÆ.

Himantopterus, Wesm. Its neuration and structure noticed; J. O. Westwood, Tr. E. Soc. 1877, pp. 437-439, pl. x. d, figs. 1-3. It is undoubtedly Lepidopterous. See also R. McLachlan, P. E. Soc. 1877, p. xvii., and Bull. Soc. Ent. Belg. xx. pp. lvi. & lvii.

Otroeda occidentis and *vespertina*, Walk., figured and redescribed by A. G. Butler, Ill. Lep. Het. i. p. 58, pl. xiv. figs. 6 & 7.

Mimeuplea, g. n., A. G. Butler, P. Z. S. 1877, p. 169. Allied to *Cyclosia* and *Pompelon*; type, *M. rhadamantha*, sp. n., l. c. p. 170, Sarawak.

New species:—

Cyclosia uniformis, A. G. Butler, P. Z. S. 1877, p. 169, Sarawak and Sumatra; *C. nigrescens*, F. Moore, tom. cit. p. 600, S. Andamans.

Amesia perifascia, A. G. Butler, J. L. S. xiii. p. 115, Malacca.

Erasmia sanguica, F. Moore, Ann. N. H. (4) xx. p. 86, Shanghai.

Chalcosia diana, A. G. Butler, P. Z. S. 1877, p. 815, Formosa.

Pidorus atratus, id. Ann. N. H. (4) xx. p. 401, Japan.

Heterusia cingala, F. Moore, l. c. p. 343, Ceylon.

LIPARIDÆ.

Penora discifera, Walk., figured by H. B. Möschler, Verh. z.-b. Wien, xxvii. pl. x. fig. 52.

Laria rossi, Curt. Transformations described, A. S. Packard, Am. Nat. xi. p. 52; Ent. M. M. xiii. pp. 228 & 229.

Euproctis digramme, Boisd., = *gutta*, Walk., p. 10, *atomaria* and *virguncula*, Walk., are redescribed and figured, pp. 11 & 13, pl. i. figs. 4 & 7; P. C. T. Snellen, Tijdschr. Ent. xx.

Carama sparshalli, Walk. (nec Curt.), renamed *C. walkeri*; *C. ovina* (?), Sepp, redescribed, p. 203, and *Phalena nivea*, Cram., referred to this genus with doubt, p. 204; A. G. Butler, Cist. Ent. ii. Butler also (l. c. p. 204) notices the characters of the genus *Trichetra*, to which he refers *Arcturus sparshalli*, Curt.

Anaphe. Its best place seems to be between *Marana* (to which several species described under *Teara* are referable) and *Numenes*. *A. reticulata* and *panda* are probably varieties; the former is well figured by Herrich-Schäffer under the name of *Arctiomorpha euprepiiformis*. A. G. Butler, Ann. N. H. (4) xix. p. 462.

Dasychira nisana, Moore. Larva described; P. C. T. Snellen, Tijdschr. Ent. xx. pp. 15 & 16.

New species :—

Aroa jonosi, A. G. Butler, Ann. N. H. (4) xx. p. 402, Japan.

Artaxa intensa, id. l. c., Japau; *A. citrina* and *cervina*, F. Moore, tom. cit. pp. 344 & 345, Ceylon.

Charotricha decussata, id. l. c. p. 345, Ceylon.

Pantana sinica, F. Moore, Ann. N. H. (4) xx. p. 92, Shanghai.

Cuviria cygna, id. P. Z. S. 1877, p. 601, S. Andamans.

Redoa flavescens and *sericea*, id. l. c. p. 600, S. Andamans; *R. alba* and *sinensis*, id. Ann. N. H. (4) xx. p. 92, Shanghai.

Lælia venosa, id. P. Z. S. 1877, p. 601, pl. lix. fig. 1, S. Andamans; *L. sangaica*, id. Ann. N. H. (4) xx. p. 92, Shanghai.

Leucoma auripes, A. G. Butler, l. c. p. 402, Japan; *L. impressa*, P. C. T. Snellen, Tijdschr. Ent. xx. p. 8, pl. i. fig. 1, Java.

Euproctis incomta (De Haan, MS.), p. 9, fig. 2, *rubiginosa*, p. 10, fig. 3, and *muelleri* (Voll. MS.), p. 13, figs. 5 & 6, id. l. c. pl. i.; *E. discinota*, F. Moore, P. Z. S. 1877, p. 601, S. Andamans.

Porthesia fumose, P. C. T. Snellen, l. c. p. 69, pl. v. figs. 3 & 4, Sumatra.

Trichetra fraterna, Moreton Bay, and *stibosoma*, New South Wales, A. G. Butler, Cist. Ent. ii. p. 204.

Carama virgo, Pará, and *plumosa*, Santarem, id. l. c. pp. 203 & 204.

Anaphe ambrozia, id. Ann. N. H. (4) xix. p. 462, Ambriz.

Dasychira lunulata, id. l. c. xx. p. 403, Japan; *D. lintneri*, A. R. Grote, Canad. Ent. ix. p. 85, Center, U. S. A.

Lymantria fumida and *aurora*, A. G. Butler, l. c. pp. 402 & 403, Japan.

PSYCHIDÆ.

F. J. M. Heylaerts remarks on breeding *Psychidæ*. Authors have made too many species: *Epichnopteryx sieboldi*, Reutti, and *heringi*, v. Hein., = *pulla*, Esp.; *Fumea intermedicella*, Bruand, = *affinis*, Reutti, and *F. crassiorella*, Bruand, probably = *roborecolella*, Bruand. Tijdschr. Ent. xx. pp. lxxxviii. & lxxxix.

A remarkable larva-case from Zanzibar, resembling a *Helix* in shape, and supposed to belong to the *Psychidæ*; R. McLachlan, P. E. Soc. 1877, p. ii.

On Californian *Psychidæ*, with descriptions of the cases of some new species; H. Edwards, P. Cal. Ac. vi.

Psyche standfussi, Herr. Schöff., p. 206, figs. 6 & 7, *plumistrella*, Hübner, p. 207, figs. 8 & 9, *zelleri*, Mann, figs. 10 & 11, *apiformis*, Rossi, figs. 12 & 13, p. 208, and *febretta*, Fonsc., var. *albipunctella*, Mill., p. 210, figs. 14-18, cases and moths figured and described, pl. cxxxii.; *P. quadrangularis*, Christoph, pp. 373-375, figs. 5-7, *præcellens*, Staud., p. 376, figs. 8 & 9, *kahri*, Led., pp. 376 & 377, fig. 10, and *viadrina*, Staud., p. 377, figs. 11 & 12, noticed and figured, pl. cxlvii.: P. Millière, Icon. iii. *P. vesubiella*, Millière: transformations described and figured by him; l. c. pp. 306 & 307, pl. cxxxviii. figs. 5-12. *P. opacella* noticed as new to France, and larva described; G. Rouast & Reynaud, Bull. Soc. Ent. Fr. (5) vii. pp. lxxxiv. & lxxxv.

Fumea nudella, Ochs., var. *vestalis*, Staud., noticed and figured by P. Millière, Ann. Ent. Belg. xx. p. 63, pl. i. fig. 4.

Epichnopteryx helicinelletta, Herr. Schöff. Transformations described and figured by P. Millière, Icon. iii. pp. 371-373, pl. cxlvii. figs. 1-4.

New genera and species:—

Chalia, F. Moore, Ann. N. H. (4) xx. p. 345; type, *Æceticus double-dayi*, Westw.

Manatha, id. l. c. p. 346; type, *M. albipes*, sp. n., l. c. p. 347, Ceylon.

Mahasena, id. P. Z. S. 1877, p. 601; type, *M. andamana*, sp. n., l. c. p. 602, pl. lix. fig. 4, S. Andamans.

Psyche turatii, O. Staudinger, S. E. Z. xxxviii. p. 178, Lombardy; *P. fragmentella* and *coniferella*, H. Edwards, P. Cal. Ac. vi., California (cases only); *P. surinamensis*, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 669, Paramaribo; *P. unicolor*, A. G. Butler, P. Z. S. 1877, p. 381, South Island, New Zealand; *P. silphella*, P. Millière, Icon. iii. p. 204 pl. cxxii. figs. 1-5, Cannes.

Fumea subflavella, P. Millière, Ann. Ent. Belg. xx. pp. 63 & 64, pl. i. figs. 5-7, South France.

Epichnopteryx mentonella, id. l. c. p. 64, pl. i. fig. 8, Menton.

Æceticus davidsoni, H. Edwards, P. Cal. Ac. vi. pl. v., California (case only); *Æ. geyeri*, C. Berg, Bull. Mosc. lii. p. 13, & Ann. Soc. Argent. iv. p. 98, Uruguay, Buenos Aires, and Patagonia.

NOTODONTIDÆ.

T. Goossens publishes an analytical table of the larvæ of the European *Notodontida*, and figures the larva of *Drynobia melagoma*, Borkh., which has been confused by previous authors, and many eggs and details of other larvæ; Ann. Soc. Ent. Fr. (5) vii. pp. 369-378.

Betusa chera, Cram. Structure described; H. B. Möschler, Verh. z.-b. Wien, xxvii. pp. 696 & 697.

Lophopteryx sieversi, Ménétr. Larva described by H. Lang, Hor. Ent. Ross. xii. pp. 151 & 152.

Stauropus fagi. Notes on its metamorphoses; H. M. Golding Bird, Ent. x. pp. 137-140. Habits of larva; E. Birchall, Ent. M. M. xiii. pp. 231-233.

Phalera flavescens, Brem. & Grey, ♂ described from Shanghai; F. Moore, Ann. N. H. (4) xx. p. 90. *P. sangana*, Moore: larva described; Piepers & Snellen, Tijdschr. Ent. xx. p. 16.

Ernolatia margaritacea, H. B. Möschler, figured by him, l. c. pl. x. fig. 51.

New genera and species:—

Hupodonta, A. G. Butler, Ann. N. H. (4) xx. p. 475. Allied to *Noto-donta* and *Phoasia*; type, *H. corticalis*, sp. n., l. c., Japan.

Gonoclostera, id. l. c. Allied to *Closteromorpha*; type, *G. latipennis*, sp. n., l. c. p. 476, Japan.

Gelastocera, id. l. c. p. 476. Allied to *Eleapa*; type, *G. exusta*, sp. n., l. c., Japan.

Eulophopteryx, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 684. Allied to *Lophopteryx*; type, *E. splendens*, sp. n., l. c. pl. x. fig. 42, Surinam.

Pseudodryas, id. l. c. p. 685. Allied to last; type, *P. olivacea*, sp. n., l. c. pl. x. fig. 43, Surinam.

Phedossia, id. l. c. p. 691. Allied to *Cælodasys*, Pack.; type, *P. turbida*, sp. n., l. c. pl. x. fig. 49, Surinam.

Euxoga, id. l. c. p. 692. Allied to last; type, *E. argenteo-punctata*, id. l. c. p. 692, pl. x. fig. 50, Surinam.

Hippia, id. l. c. p. 693. Allied to *Nystalea*; type, *Phalana mumetes*, Cram. (redescribed, p. 694).

Lepasta, id. l. c. p. 694. Allied to *Nystalea*; type, *N. bractea*, Feld.

Platyodontia ? *strigata*, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 683, pl. x. fig. 41 (generic characters noticed, p. 682).

Bireta pallida, A. G. Butler, Ann. N. H. (4) xx. p. 473, Japan.

Cerura menciana and *sangaica*, F. Moore, tom. cit. pp. 89 & 90, Shanghai; *C. lanigera*, A. G. Butler, l. c. p. 474, Japan.

Dicranura felina, id. l. c., Japan.

Peridea gigantea, id. l. c., Japan.

Pterostoma sinica [-cum], F. Moore, l. c. p. 91, Shanghai.

Lophopteryx sinensis, id. l. c. p. 91, Shanghai; *L. americana*, L. F. Harvey, Canad. Ent. ix. p. 95, Philadelphia.

Ceira straminea, F. Moore, l. c. p. 91, Shanghai.

Stauropus basalis, id. l. c. p. 90, Shanghai.

Phalera signata, A. G. Butler, *l. c.* p. 473, Japan.

Heterocampa surinamensis and *herbida*, H. B. Möschler, *l. c.* p. 686, pl. x. figs. 44 & 45, Surinam; *H. salicis*, H. Edwards, P. Cal. Ac. vi., California.

Dasytophia ? *lignicolor*, H. B. Möschler, *l. c.* p. 687, pl. x. fig. 46, Paramaribo (generic characters discussed, *l. c.*).

Symmerista (Hübner); generic characters discussed, p. 688) *mus*, fig. 47, and *dubia*, p. 689, *brunnea*, p. 690, fig. 48, *id. l. c.* pl. x., Surinam.

LIMACODIDÆ.

Miresa nitens, Walk. Transformations described by Piepers & Snellen, Tijdschr. Ent. xx. pp. 16-18. The male and some details figured, pl. i. figs. 8, 8a, & 8b.

Parasa lepida, Moore. Larva described; *id. l. c.* pp. 18 & 19: neurulation figured, pl. ii. fig. 9.

Asbolia micans, H. B. Möschler, figured by him, Verh. z.-b. Wien, xxvii. pl. x. fig. 35.

Euclea incisa, Harv., and *prenulata*, are distinct; A. R. Grote, Canad. Ent. ix. p. 85.

Cacæcia ? *gallicolens*, Butl., is not a *Tortrix*, but = *Morova subfasciata*, Walk.; A. G. Butler, P. Z. S. 1877, p. 382.

New genera and species :—

Phricolepia, A. G. Butler, Ann. N. H. (4) xx. p. 476. Allied to *Natada*; type, *P. sericea*, sp. n., *l. c.*, Japan.

Eulimacodes, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 672. Allied to *Limacodes*; type, *E. distincta*, sp. n., *l. c.* pl. x. fig. 37, Paramaribo.

Asbolia sericea, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 671, pl. x. fig. 36, Paramaribo.

Parasa tessellata and *sinica*, F. Moore, Ann. N. H. (4) xx. p. 93, Shanghai.

Miresa pallivitta, *id. l. c.*, Shanghai.

Setora sinensis, *id. l. c.*, Shanghai.

Limacodes latornia, L. F. Harvey, Canad. Ent. ix. p. 75, Texas.

Thosea cervina, F. Moore, *l. c.* p. 348, Ceylon.

Belippa ferruginea, *id. l. c.*, Ceylon.

Lagoa krugi, H. Dewitz, MT. Münch. ent. Ver. i. p. 95, Porto Rico and Colombia.

SICULIDÆ.

This group is monographed by A. Guénée, Ann. Soc. Ent. Fr. (5) vii. pp. 275-304. He characterizes several genera of which only names had previously been published, and describes many species which had previously been only figured by himself and others. He divides them into three subfamilies—*Pachythyri*[*di*]dæ, containing the genus *Pachythyris*, Feld.; *Striglinidæ*, containing *Mathoris*, g. n., and *Striglina*, Guén.; and *Siculidæ*, containing *Rhodoneura*, *Siculodes*, and *Hepialodes*, Guén.

Mathoris, g. n., A. Guénée, *l. c.* p. 282. Allied to *Striglina*, Guén.; to contain *S. roseola*, Feld., *M. crepuscula*, sp. n., *l. c.* p. 283, Amazon region, and ? *Acidalia quadrigata*, Feld.

New species :—

Striglina lineola, Bengal, and *australina*, Australia, p. 284, *clathrula*, locality unknown, p. 285; and *scallula*, Brazil, p. 286, *id. l. c.*

Rhodoneura reticularis, p. 616, *tetraonalis*, pl. ix. fig. 10, and *marmorialis*, p. 617, F. Moore, P. Z. S. 1877, S. Andamans; *R. minicula*, A. Guénée, *l. c.* p. 288, N. China.

Siculodes virginula, Brazil, p. 289, *eupithecula*, Cayenne, p. 291, *unitula*, p. 292, *avicula*, p. 293, *mediula*, p. 295, *serpula*, p. 296, and *frondicula*, p. 299, all from Brazil, *plagula*, p. 300, Madagascar, *vittula*, p. 301, N. China, and *nullula*, p. 302, Rio Janeiro, *id. l. c.*

DREPANULIDÆ.

Platypteryx binaria, Hufn. Var. or sp. n. ? *meridionalis* described and figured in all stages by P. Millière, Icon. iii. pp. 212–215, pl. cxxiii. figs. 1–5.

Drepana sicula. Transformations described; W. Buckler, Ent. M. M. xiv. pp. 1–4.

Hypsomadius, g. n., A. G. Butler, Ann. N. H. (4) xx. p. 478. Allied to *Drepana*; type, *H. insignis*, sp. n., *l. c.* p. 479, Japan.

Drepana scabiosa, *id. l. c.* p. 478, and *D. japonica*, F. Moore, *op. cit.* p. 94, both from Japan; *D. fulvata*, P. C. T. Snellen, Tijdschr. Ent. xx. p. 19, pl. ii. fig. 10, Java.

Oreta turpis, *calida*, and *pulchripes*, p. 477, and *calceolaria*, p. 478, A. G. Butler, *l. c.*

Tagora murina, F. Moore, *l. c.* p. 347, Ceylon.

SATURNIIDÆ.

Breyeria borinensis, De Borre, supposed to be a Saturnid, is an Ephe-
meron; R. McLachlan, Bull. Soc. Ent. Belg. xx. pp. xxxvi. & xxxvii.

Notes on the African *Saturniida* in the collection of the Royal Dublin Society; W. F. Kirby, Tr. E. Soc. 1877, pp. 15–21. *Antheraea dione*, Fabr., *A. guinezi*, Staud., *Gynanisa isis*, Westw., and *G. maia*, Klug, are noted as distinct.

Platysamia cecropia. Transformations and larval variation, &c., described at great length; T. G. Gentry, Canad. Ent. ix. pp. 41–50. Two pupæ, of opposite sexes, in one cocoon; C. E. Worthington, *op. cit.* p. 60. It will eat alder; W. Saunders, *op. cit.* p. 160.

Samia gloveri and *columbia* are probably identical; H. Hagen, Canad. Ent. ix. p. 13.

Attacus yama-mai. Note on an aberration; M. Girard, Bull. Soc. Ent. Fr. (5) vii. p. xxxvii.

Actias luna, Linn., noticed and figured by W. Saunders, Canad. Ent. ix. p. 33.

Saturnia atlantica, Luc. P. Millière publishes Bruand d'Uzelle's description and figures of this species; Icon. iii. pp. 187-191, pl. cxx. *S. carpini*: var. without ocelli figured and described by F. Bond, Ent. x. pp. 1 & 2; a common cocoon spun by two larvæ, Girard & Xambou, Bull. Soc. Ent. Fr. (5) vii. p. lxx. *S. cynthia* is thoroughly acclimatized in France, where it feeds on lilac; Pet. Nouv. ii. p. 158. *S. io*: food-plants; S. W. Goodell, Canad. Ent. ix. p. 180. *S. isabellæ*, Graells, noticed by him; Bull. Soc. Ent. Fr. (5) vii. pp. cxxxi. & cxxxi. (cf. also Pet. Nouv. ii. p. 162. *S. (Brahmæa) lunulata*, Brem., and var. *ledereræ*, Rogenh.: larva noticed; H. Christoph, Hor. Ent. Ross. xii. p. 207.

Hyperchiria iris, Walk., ? = *orestes*, Boisd., *H. abdominalis*, Feld., = *liberia*, Cram. (variation noticed), *H. auletes*, Herr. Schöff., = *abas*, Fabr., = *abasia*, Cram. (redescribed), and *H. approximans*, Walk., noticed; H. B. Möschler, Verh. z.-b. Wien, xxvii. pp. 677 & 678. *H. griseo-flava*, Phil., recorded from Buenos Aires; C. Berg, Bull. Mosc. lii. p. 19, Ann. Soc. Argent. iy. p. 102.

Pseudohazis hera, Harr., and *eglanterina*, Boisd., may be distinct; *Hemileuca picæ*, Walk., is identical with the former: A. R. Grote, Canad. Ent. ix. p. 96.

Hemileuca maia feeds on aster as well as on oak; R. Bunker, *tom. cit.* p. 119.

Mimallo, Hübn. C. Berg monographs this genus, admitting and mostly redescribing 18 species, all known. He figures the transformations of *M. despecta*, Walk. Hor. Ent. Ross. xii. pp. 158-176, pl. iv. a, figs. 1-7.

Ancistrotæ and *Teratopteris*, Hübn., are referred to the *Saturniidae*, and recharacterized; H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 679.

New species :—

Attacus atbarinus, A. G. Butler, Cist. Ent. ii. p. 161, Abyssinia.

Bunæa aslauga, Madagascar, and *thomsoni* [? = *phædusa*, Dru., ♂], W. F. Kirby, Tr. E. Soc. 1877, pp. 18 & 19.

Antheræa huebneri (= *cytherea*, Hübn., nec Fabr.), W. F. Kirby, l. c. p. 20, locality unknown; *A. andamana*, F. Moore, P. Z. S. 1877, p. 602, S. Andamans; *A. lastrygon*, P. Mabille, Bull. Soc. Ent. Fr. (5) vii. p. clxxx.

Caligula japonica and *jonasii*, A. G. Butler, Ann. N. H. (4) xx. p. 479, Japan.

Rhodia fugax, id. l. c. p. 480, Japan.

Actias ignescens, F. Moore, P. Z. S. 1877, p. 602, S. Andamans.

Tropæa gnoma, A. G. Butler, l. c. p. 480, Japan.

Eudemonia argiphontes (Maassen, MS.), W. F. Kirby, l. c. p. 20, Sierra Leone.

Saturnia flavida, A. G. Butler, l. c. xix. p. 462, Zambesi.

Hyelosia nigricans, C. Berg, Acta Ac. Nac. Cienc. Exact. i. p. 157; An. Soc. Argent. iv. p. 101; Bull. Mosc. lii. p. 18, Patagonia, Buenos Aires.

Mimallo incerta, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 676, pl. x. fig. 40, Paramaribo.

ENDROMIDÆ.

Endromis versicolora, var. *lapponica* described by A. Bau, S. E. Z. xxxviii. p. 152.

BOMBYCIDÆ.

Various papers on sericiculture may be found in Bull. Soc. d'Acclim. (3) iv.

Mesoscia, Hübn. Recharacterized, with *Phalœna pusilla*, Cram., as the type; H. B. Möschler, Verh. z.-b. Wien, xxvii. pp. 673 & 674.

Chrysopyga, Herr. Schöff., recharacterized; *id. l. c.* pp. 674 & 675.

Megalopyge lanata, Cram. (= *lanifera*, Hübn., = *citri*, Sepp). Structure discussed; *id. l. c.* p. 676.

Gastropacha vishnou, Lef. Transformations described; Piepers & Snellen, Tijdschr. Ent. xx. pp. 21 & 22.

Lasiocampa otus, Dru. Cocoon, &c.; L. Tailla-Fedaldi, Pet. Nouv. ii. pp. 183 & 184. *L. sordida*, Ersch.; larva noticed by H. Christoph, Hor. Ent. Ross. xii. p. 206.

Megasoma repanda, Hübn., var. or sp. n. Larva and imago noticed from Schahrud; *id. l. c.* pp. 206 & 207.

Bombyx canensis, P. Millière, redescribed and figured by him; Ann. Soc. Ent. Fr. (5) vii. p. 1, pl. i. figs. 9 & 10. It is only a var. of *B. populi*, and probably = *B. alpinus*, Zell.; Bellier de la Chavignerie, *op. cit.* pp. 367 & 368. *B. eversmanni*, Eversm.: larva described, and larva and imago figured by P. Millière; Icon. iii. pp. 181 & 182, pl. cxviii. figs. 9 & 10. *B. franconica*, Esp., var. noticed and figured, with larvæ; *id. l. c.* pp. 282 & 283, pl. cxxxiv. figs. 3 & 4. *B. ilicis*, Ramb.: larva described and figured; *id. l. c.* p. 281, pl. cxxxiv. fig. 2. *B. lanestris*, Linn., var. ♀ *arbuscula*, Freyer, noticed and figured; *id. l. c.* pp. 283 & 284, pl. cxxxiv. figs. 6 & 7. *B. rubi*: parasites on larva noticed; V. R. Perkins & E. K. Robinson, Ent. x. pp. 258, 301, & 302.

Clisiocampa sylvatica. Habits, and figure of larvæ; W. Saunders, Canad. Ent. ix. pp. 158 & 159.

Dryocampa rubicunda, Fabr. W. V. Andrews doubts if the larva described by J. A. Lintner really belongs to that species; *tom. cit.* p. 180.

New species :—

Chrysopyga pellucida, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 67, Paramaribo.

Hydrias murina and *nebulosa*, *id. l. c.* p. 475, pl. x. figs. 38 & 39, Surinam.

Trabala cristata, A. G. Butler, Ann. N. H. (4) xx. p. 480, Japan.

Odonestis excellens, *superans*, and *spectabilis*, *id. l. c.* p. 481, Japan.

Bombyx waringi (Teysm., MS.), P. C. T. Snellen, Tijdschr. Ent. xx. p. 20, pl. ii. fig. 11, Java.

Lebeda variegata, F. Moore, Ann. N. H. (4) xx. p. 347, Ceylon.

Æona segregata, A. G. Butler, *l. c.* p. 482, Japan.

Anisota heiligbrodti, L. F. Harvey, Canad. Ent. ix. p. 110.

ZEUZERIDÆ.

Cossus. An undetermined species, supposed to have been imported into New Zealand from Australia in timber; R. W. Fereday, Tr. N. Z. Inst. ix. pp. 459 & 460. *C. strizæ*, Linn.: transformations noticed; Piepers & Snellen, Tijdschr. Ent. xx. p. 22.

Zeuzera pyracmon, Cram., noticed; H. B. Möschler, Verh. z.-b. Wien, xxvii. pp. 670 & 671.

Cossus centerensis, sp. n., J. A. Lintner, Canad. Ent. ix. p. 129, Center.

Zeuzera nigra, sp. n., F. Moore, Ann. N. H. (4) xx. p. 348, Ceylon.

HEPIALIDÆ.

Churagia fischeri, Feld., = *C. rubro-viridans*, Walk.; *Elhamma cervinata*, Walk., is a *Porina*: A. G. Butler, P. Z. S. 1877, pp. 380 & 381.

Hepialus behrensi and *montana* are sexes of one species; A. R. Grote, Canad. Ent. ix. p. 214.

New species:—

Hepialus latus (? = *sylnivus*, var.), O. Staudinger, S. E. Z. xxxviii. p. 177, Manglis, South Caucasus; *H. excrescens* and *œmulus*, A. G. Butler, Ann. N. H. (4) xx. p. 482, Japan.

Pharmacis (Hüb., recharacterized, l. c.) *lagopus*, H. B. Möschler, Verh. z.-b. Wien, xxvii. p. 670, pl. ix. fig. 34, Surinam.

Phassus sinensis, F. Moore, Ann. N. H. (4) xx. p. 94, Shanghai.

Charagia hectori, A. G. Butler, P. Z. S. 1877, p. 380, North Island, New Zealand.

Porina enysi, id. l. c. p. 381, pl. xlii. fig. 7, North Island, New Zealand.

NOCTUIDÆ.

Nonagria juncicolor, Guén., = *Leucania unica*, Walk.; *Amphitape crassitibia*, Feld., = *Ipana leptomera*, Walk.; *Alysia specifica*, Guén., = *Agrotis nullifera*, Walk.; *Hadena nervata*, Guén., = *Heliothobus disjunctus*, Walk.; *Nitocris bicomma*, Guén., = *Hadena plusiata*, Walk., and is congeneric with *Mamestra comma*, Walk.; *Euplexia insignis*, Walk., pt., = *Hadena lignifusca*, Walk., possibly = *H. mutans*, var.; *Xylina turbida*, Walk., = *Euplexia insignis*, Walk., pt.; and *X. vezata*, Walk., is closely allied; *Mamestra maori*, Feld., = *Auchmis composita*, Guén.; *Xylina* ? *deceptura*, Walk., = *X. inceptura*, W.; *X. provida*, Walk., = *canescens*, Walk.; *Bityla thoracica*, Walk., = *X. defigurata*, Walk.: A. G. Butler, P. Z. S. 1877, pp. 382-387.

Cymatophora flavicornis. Egg described; J. Hellins, Ent. M. M. xiii. p. 210.

Acronycta alni. Note on larva; J. P. Barrett, op. cit. xiv. pp. 90 & 91, Ent. x. pp. 237 & 238, cf. also T. W. Daltry & H. A. Stowell, Ent. x. p. 287.

Apatela hamamelis, Guén. Larva described; L. W. Goodell, Canad. Ent. ix. p. 61.

Mithymna impar, Staud., noticed and figured by P. Millière, Icon. iii. p. 392, pl. cxlix. figs. 6 & 7.

Leucania unipuncta, Haw., pp. 47-50, and *albilinea*, Grote, pp. 50-57, discussed, with figures and descriptions of the latter in all stages; C. V. Riley, Rep. Ins. Mo. ix.; for the former, cf. *id.* P. Am. Ass. xxv. pp. 279-283. *L. tangala*, Feld., = ? *extermata*, Guén.; P. C. T. Snellen, Tijdschr. Ent. xx. p. 23.

Calamia lutosa, Hübn. On rearing; Lodeesen & Van Leeuwen, Tijdschr. Ent. xx. p. xxiv.

Proxenus hospes, Freyer, redescribed and figured by P. Millière (with additional notes by A. Guénée), Icon. iii. pp. 288-293, pl. cxxxv. figs. 9 & 10.

Gortyna rigida, A. R. Grote, redescribed by him; Canad. Ent. ix. p. 87.

Axylia putris. Larva described; G. T. Porritt, Ent. M. M. xiii. pp. 248 & 249.

Spodoptera insulsa and *Prodenia infecta* and *glaucistriga*, Walk., = *S. cilium* and *nubes* and *P. citigera*, Guén., respectively; F. Moore, P. Z. S. 1877, p. 604.

Glottula dominica, Cram. Transformations noticed; Picpers & Snellen, Tijdschr. Ent. xx. p. 25.

Aporophylla catalannensis, P. Millière, redescribed and figured by him; Icon. iii. pp. 368 & 369, pl. cxlvi. figs. 4 & 5.

Cladocera optabilis, Boisd. Larva and imago described and figured, *id.* l. c. pp. 299-302, pl. cxxxvii. figs. 4 & 5.

Heliophobus fallax, Staud., noticed and figured; *id.* l. c. p. 416, pl. cli. figs. 12 & 13.

Crymodes sommeri, Millière (*nec* Lefebvre), is renamed *Hadena islandica*, *id.* l. c. p. 459.

Mamestra adjuncta, Guén.: larva described; L. W. Goodell, Canad. Ent. ix. p. 61. *M. dissimilis*, var. *discolor*, Spoy., = *M. atlantica*, Grote; A. R. Grote, l. c. p. 22. *M. immunda*, Eversm.: P. Millière describes and figures the transformations of var. *halimi*, from Cannes; Ann. Ent. Belg. xx. pp. 58-60, pl. i. figs. 17-19. *M. siccanorum*, Staud., figured and redescribed; *id.* Icon. iii. p. 421, pl. clii. fig. 8.

Miana inornata, Walk., = *Illatia cephusalis*, Walk., and belongs to the *Apamiidæ*; F. Moore, P. Z. S. 1877, p. 604.

Perigea illecta, Walk., = *cano-rufa*, Walk.; *id.* l. c. p. 604.

Caradrina lepigone, Möschl., female described; A. Rössler, S. E. Z. xxxviii. p. 364. *C. cubicularis*: larva described by A. Guénée, who refers the species to the genus *Laphygma*; Millière, Icon. iii. pp. 292 & 293.

Alamis spoliata, Walk., = *Amyna selenampha*, Guén.; F. Moore, P. Z. S. 1877, p. 604.

Agrotis. P. Millière (Icon. iii.) redescribes and figures the following species, mostly with their transformations: *obesa*, Boisd., pp. 302-304, pl. cxxxvii. figs. 1-3; *engadinensis*, Mill., pp. 308 & 309, pl. cxxxix. fig. 2; *A. (P.) arenicola*, Staud., perhaps an *Aporophylla*, p. 370, pl. cxlvi. fig. 6; *culminicola*, Staud., p. 383, pl. cxlviii. figs. 2 & 3; *saucia*, Hübn., var. *æqua*, Geyer, pp. 383 & 384, pl. cxlviii. figs. 4-6, and *rogneda*, Staud., pp. 395 & 396, pl. cxlix. fig. 14. *A. forcipula*, Hübn.: German and Swiss specimens compared; A. Fuchs, S. E. Z. xxxviii. p. 138. *A. saucia* recorded from Patagonia; C. Berg, An. Soc. Argent. iv. p. 199.

Triphæna subsequa. Note on larva ; H. Williams, Ent. x. p. 48.

Pachnobia hyperborea (alpina), Wocke). Note on food-plant and young larvæ ; J. Hellins, Ent. M. M. xiii. pp. 183 & 184. *P. rubricosa*, Fabr. : larva and imago noticed and figured ; P. Millière, Icon. iii. pp. 441 & 442, pl. cliv. figs. 4 & 5.

Orthosia infumata, Grote, is a *Cosmia*, closely allied to the European *paleacea* ; A. R. Grote, l. c. p. 22.

Glæa arcuosa, *tremula*, and *pastillicans* will form a distinct section of the genus, characterized by the dorsal crest. According to Morrison, *venustula* is a synonym of *sericea* ; id. l. c. p. 70.

Scopelosoma pettiti, Grote, redescribed ; id. l. c. pp. 213 & 214.

Dianthæcia casia, egg described ; J. Hellins, l. c. xiii. p. 210.

Polia xantho-mista, var. *nigro-cincta*. Note on larva ; J. Leather, Ent. x. pp. 20 & 21. *P. vetula*, Dup. : transformations figured and described by P. Millière, Icon. iii. pp. 366-368, pl. cxlvi. figs. 7-9.

Dryobata stigmata, A. R. Grote. Male described by him, l. c. p. 199.

Epunda lutulenta. Transformations described ; C. Fenn, Ent. M. M. xiii. pp. 184 & 185.

Hadena alpigena, Boisd. (of which *H. meissonieri*, Guén., may be the ♀), noticed and figured by P. Millière, Icon. iii. p. 308, pl. cxxxix. fig. 1. *H. quasita*, Grote, = *lynicolor*, var. ; *H. interna*, Grote, = *delicata*, var. A. R. Grote, l. c. p. 197. *H. satura* taken in April ; V. R. Perkins, Ent. x. pp. 99.

Lithocampa millierii, Staud., redescribed and figured in all stages by P. Millière, Icon. iii. pp. 219-223, pl. cxxiv.

Cucullia anthemidis, Guén. Transformations figured and described ; id. l. c. pp. 363 & 364, pl. cxlv. figs. 6-8.

Euterpia laudeti, Boisd. Transformations figured and described ; id. l. c. pp. 244-246, pl. cxxxviii. figs. 1-4.

Stephania puniceago, Boisd. Larva described and figured with the imago ; id. l. c. pp. 313 & 314, pl. cxxxix. figs. 6 & 7.

Heliothis armigera. Life history : a very destructive insect to vegetation, and a cannibal ; W. H. Tugwell, Ent. x. pp. 283 & 284. *H. scutosa* : its occurrence in Britain, C. G. Barrett & J. B. Hodgkinson, Ent. M. M. xiii. pp. 280 & 281, xiv. pp. 17, 18, & 67 ; described and figured, E. A. Fitch, Ent. x. pp. 105-108.

Anthæcia purpurascens, Tausch. Larva described, and larva and imago figured by P. Millière, Icon. iii. pp. 247 & 248.

Acontia lucida, Hufn. Larva described and figured ; id. l. c. pp. 295 & 296, pl. cxxxvi. fig. 4. *A. moldavicola*, Herr. Schöff., var. *euboica*, from the island of Eubœa described and figured ; id. l. c. pp. 437 & 438, pl. cliv. fig. 1.

Thalpochares candidana, Fabr., var. *cantabrica*, from Bilbao, described ; A. Rössler, l. c. pp. 364 & 365. *T. communimacula*, W. V. : larva (with ten legs) described and figured, with the imago ; P. Millière, l. c. pp. 311 & 312, pl. cxxxix. figs. 4 & 5.

Metoptria monogramma, Hübn. Transformations figured and described ; id. l. c. pp. 354-356, pl. cxliv. figs. 12-14.

Homodes crocea, Guén., figured by F. Moore, P. Z. S. 1877, pl. lx. fig. 3.

Plusia chiranthi, Tausch., pp. 294 & 295, pl. cxxvi. figs. 1-3, and *P. ni*, Hübn., pp. 394 & 395, pl. cxlix. figs. 11-13. Transformations figured and described by P. Millière, Icon. iii. *P. iota*: transformations noticed; *Pet. Nouv.* ii. p. 163.

Spitherops cataphanes, Hübn. Transformations figured and described by P. Millière, Icon. iii. pp. 385 & 386, pl. cxlvi. figs. 1-3.

Polydesma mastrucatum, Feld. & Rog., = *P. boarmoides*, Guén., F. Moore, l. c. p. 606.

Homoptera edusa, *lunata*, and *saundersi* compared; T. E. Bean, *Canad. Ent. ix.* pp. 174-177. Sexes of *H. lunata*; id. l. c. p. 228.

Parthenos, Hübn., preoccupied in *Rhopalocera*, is renamed *Catocalirrhis*; W. V. Andrews, *Canad. Ent. ix.* p. 20, *Ent. M. M.* xiii. p. 246.

Catocala. 18 North American species of the black-winged group enumerated by L. F. Harvey, *Canad. Ent. ix.* p. 193; he describes a var. of *C. residua*, Grote, l. c. p. 194. Several North American species noticed; A. R. Grote, *tom. cit.* pp. 168-170. On collecting in the day-time; W. Murray, *tom. cit.* pp. 18 & 19. Captures at sugar at Center, N. Y.; J. S. Bailey, *tom. cit.* pp. 215-218. *C. elocata*, Esp.: transformations figured and described by P. Millière, Icon. iii. pp. 253-255, pl. cxxix. figs. 4-6. *C. fraxini* and *nupta* recorded from Berwickshire; W. Shaw, *Scot. Nat. iv.* p. 12. *C. angasi*, figs. 1 & 2, *insolabilis*, fig. 3, and *residua*, fig. 4, of A. R. Grote noticed and figured by him; *Bull. Buff. Soc.* iii. pp. 187 & 188, pl. v. *C. promissa*: transformations described; W. Buckler, *Ent. M. M.* xiii. pp. 233-236. *C. puerpera*, var. *orientalis*, from South Russia, described by O. Staudinger, *S. E. Z.* xxxviii. p. 202.

Noctua pomona, Cram., and *dioscorea*, Fabr., = *Ophideres fullonica*, Linn.; *Phyllodes perspicillator*, Guén., = *consobrina*, Westw. F. Moore, P. Z. S. 1877, pp. 607 & 608.

Ophideres fullonica and its allies do not perforate oranges, &c., but enlarge the hole previously made by some other insect, and suck the juice through that; G. L. Pilcher, *Cist. Ent. ii.* pp. 237-240. *O. dioscorea*, Fabr., is doubtless a modification of *O. fullonica*; A. G. Butler, *Ann. N. H.* (4) xx. p. 357. *O. materna*, Linn., taken at sea, 300 miles from Mauritius, the nearest land; R. McLachlan, P. E. Soc. 1877, p. v. Recorded from Florida; A. R. Grote, P. Bost. Soc. xviii. p. 416.

Phyllodes perspicillator, Guén. (= *consobrina*, Westw.), recorded from Cochín China; H. Lucas, *Bull. Soc. Ent. Fr.* (5) vii. p. clxiii.

Spiramia suffumosa, Guén., = *retorta*, Linn., ♂; P. C. T. Snellen, *Tijdschr. Ent. xx.* p. 33.

Erebis zenobia in the United States; P. A. Hoy, *Canad. Ent. ix.* p. 219.

Hamodes creberrima, Walk., redescribed and figured by P. C. T. Snellen, l. c. p. 33, pl. iii. fig. 19, Java.

Noctua leonina, Fabr., and *Lagoptera magica*, Hübn., = *L. coronata*, Fabr.; *N. tigrina*, Fabr., = *Achæa melicerta*, Dru.: F. Moore, P. Z. S. 1877, p. 609.

Pseudophia illunaris, Hübn. Larva and imago described and figured by P. Millière, Icon. iii. pp. 239 & 240, pl. cxxvi. figs. 8 & 9.

Prothymia baueri, Staud., redescribed and figured; *id.* l. c. p. 442, pl. cliv. fig. 6.

Phalena virbia, Cram., and *Remigia bifasciata*, Walk., = *R. archesia*, Cram.; F. Moore, l. c. p. 611.

Drepanodes scitaria, Walk., = *Thermesia reticulata*, W.; *id.* l. c.

New genera and species:—

Ramadasa, F. Moore, P. Z. S. 1877, p. 603 (*Glottulidæ*). Type, *Chasmina pavo*, Walk. (figured, l. c. pl. lix. fig. 8).

Fiskia, A. R. Grote, Canad. Ent. ix. p. 21. Allied to *Mamestra*; type, *F. enthea*, sp. n., l. c., Maine.

Orbifrons, O. Staudinger, S. E. Z. xxxviii. p. 187. To be placed between *Agrotis* and *Brithys*; type, *O. singularis*, sp. n., l. c., Turkestan.

Synclerostoma, O. Berg, An. Soc. Argent. iv. p. 202. Between *Hiptelia* and *Mesogona* (*Orthosiidæ*); type, *S. pampeana*, sp. n., l. c. p. 203, Patagonia.

Homoglaea, H. K. Morrison, P. Bost. Soc. xviii. p. 240. Allied to *Scopelosoma*; type, *H. hircina*, sp. n., l. c., Illinois.

Meterana, A. G. Butler, P. Z. S. 1877, p. 385. Allied to *Erana*; type, *Dianthæcia pictula*, White, noticed and refigured, l. c. p. 386, pl. xlii. fig. 1.

Fruva, A. R. Grote, Canad. Ent. ix. p. 69. Allied to *Spraguia*; to include *tortricina*, Zell., *fusciatella*, Grote (type), *F. obsoleta*, sp. n., l. c., Illinois; and perhaps *Taroche angustipennis*.

Tripudia, *id.* l. c. Allied to the last (?); to include *Erastria quadri-fera*, Zell., and *T. flavo-fusciata*, sp. n., l. c. p. 70.

Antaplaga, *id.* l. c. p. 70. Allied to *Schinia*; type, *A. dimidiata*, sp. n., l. c. p. 71, Colorado.

Apatela (*Acronycta*) *falcula*, *id.* l. c. p. 86.

Acronycta walkeri, W. V. Andrews, *tom. cit.* p. 98, New Jersey.

Leucania leucostigma and *cænosa*, P. C. T. Snellen, Tijdschr. Ent. xx. pp. 23 & 24, pl. ii. figs. 12 & 13, Java; *L. costalis*, F. Moore, P. Z. S. 1877, p. 603, pl. lix. fig. 11, S. Andamans and India.

Heliophila pilipalpis, A. R. Grote, P. Bost. Soc. xviii. p. 415, Florida.

Thalophila cuprea, F. Moore, P. Z. S. 1877, p. 604, pl. lix. fig. 10, Andamans.

Ochria buffaloensis, A. R. Grote, Canad. Ent. ix. p. 88, Buffalo.

Luperina ? (*Heterographa*) *mira*, O. Staudinger, S. E. Z. xxxviii. p. 185, Turkestan.

Mamestra beani, A. R. Grote, l. c. p. 87, Illinois.

Xylophasia offuscata, O. Berg, An. Soc. Argent. iv. p. 201, Patagonia.

Mamestra zellersi, H. Christoph, Hor. Ent. Ross. xii. p. 250, pl. vi. fig. 24, Krasnovodsk.

Apamea modestissima, P. C. T. Snellen, Tijdschr. Ent. xx. p. 26, pl. ii. fig. 14, Java; *A. vitiosa*, A. G. Butler, P. Z. S. 1877, p. 384, pl. xlii. fig. 3, South Island, New Zealand.

Perigea icole, A. R. Grote, P. Bost. Soc. xviii. p. 414, Florida.

Caradrina bilunata, *id.* Canad. Ent. ix. p. 199, Massachusetts.

Agrotis perpolita, Maine, and *fauna*, Guadalupe Island, Lower Cali-

fornia, p. 237, *olivina*, Utah, *communosa*, Colorado, *hera*, Massachusetts, and *personata*, Illinois, p. 238, and *orthogonia*, Nebraska, p. 239, H. K. Morrison, P. Bost. Soc. xviii.; *A. albifurca* and *difficilis*, N. Erschoff, Hor. Ent. Ross. xii. p. 337, Irkutsk; *A. degeniata*, *sollers*, and *raddii*, pp. 244-246, *heringi*, p. 248, and *mustelina*, p. 249, all from Schahkukh, and *conifera* (Zell., MS.), p. 249, Kurusch, H. Christoph, *l. c.* pl. vi. figs. 18-23; *A. pexa*, C. Berg, *l. c.* p. 199, Patagonia; *A. sollers*, N. Persia, *caucasica*, S.W. Caucasus, *heringi*, N. Persia, *leonina*, Sarepta, *spinosa*, S. Russia, and *mustelina*, N. Persia, O. Staudinger, *l. c.* pp. 179-184; *A. trabalis*, A. R. Grote, Canad. Ent. ix. p. 198, Massachusetts and Montreal; *A. mitis*, A. G. Butler, P. Z. S. 1877, p. 383, pl. xlii. fig. 5, South Island, New Zealand.

Graphiphora tartarea, id. *l. c.* p. 384, pl. xlii. fig. 2, New Zealand.

Segetia proxima, H. K. Morrison, P. Bost. Soc. xviii. p. 240, Texas.

Teniocampa revicta, id. *l. c.* p. 241, Illinois.

Orthosia lutosa, W. V. Andrews, Canad. Ent. ix. p. 99, New Jersey.

Glaea carnosa, A. R. Grote, *l. c.* p. 21, Maine and Rhode Island.

Scopelosoma tristigmata, id. *l. c.* p. 156, Massachusetts.

Polia pallifera, id. *l. c.* p. 88, Illinois.

Heterochroma leucographa, P. C. T. Snellen, Tijdschr. Ent. xx. p. 70, pl. v. figs. 5 a-d, Sumatra.

Checupa tinctoides, id. *l. c.* p. 71, pl. v. fig. 6, Sumatra.

Hadena debilis (? *mutans*, var.), A. G. Butler, *l. c.* p. 385, pl. xlii. fig. 6, North Island, New Zealand.

Lithophane baileyi, p. 86, Albany, N.Y., and Canada, and *viridipallens*, p. 215, Massachusetts, A. R. Grote, *l. c.*

Anarta tenebricosa, H. B. Möschler, S. E. Z. xxxviii. p. 498, Greenland.

Lygranthæcia scissa, A. R. Grote, P. Bost. Soc. xviii. p. 415, Florida.

Apsarasa figurata, F. Moore, P. Z. S. 1877, p. 604, S. Andamans.

Hemerostia aurantiana, W. B. Pryor, Cist. Ent. ii. p. 235, pl. iv. fig. 12, Shanghai.

Agrophila deleta, O. Staudinger, *l. c.* p. 190, Algeria.

Tarache abdominalis, A. R. Grote, Canad. Ent. ix. p. 157, Texas.

Eustrotia maria, id. *l. c.* p. 67, Buffalo.

Thalpochara orba, id. *l. c.* p. 68, Alabama; *T. fugitiva* and *jocularis*, H. Christoph, *l. c.* pp. 253 & 254, pl. vi. figs. 25 & 26, Schahkukh.

Spragueia plumbifimbriata, A. R. Grote, *l. c.* p. 68, Texas.

Homodes ? *thermesioides*, P. C. T. Snellen, *l. c.* p. 28, pl. ii, figs. 15 a-c, Java.

Mestleta duplexa, F. Moore, *l. c.* p. 611, pl. lx. fig. 5, S. Andamans.

Plusia sackeni, A. R. Grote, Canad. Ent. ix. p. 136, Colorado; *P. howardi*, H. Edwards, P. Cal. Ac. vi., Arizona.

Westermannia triangularis, F. Moore, *l. c.* p. 605.

Bityla sericea, A. G. Butler, P. Z. S. 1877, p. 387, pl. xlii. fig. 12, South Island, New Zealand.

Pericyma terrigena, H. Christoph, *l. c.* p. 254, pl. vi. fig. 27, Krasnoyodsk and Schahkukh; *P. grandis*, O. Staudinger, *l. c.* p. 191, Turkestan.

Stictoptera transversa, P. C. T. Snellen, *l. c.* p. 30, pl. iii. fig. 16, Java.

Leucanitis picta, p. 192, Syria, S. Russia, Turkestan, *tenera*, p. 194, L.

(*Palpangula*) *henkii*, p. 196, both from S. Russia, *L. dentistrigata*, p. 199, Turkestan, O. Staudinger, l. c.; *L. cailino*, H. Christoph, l. c. p. 257, pl. vii. fig. 28, Krasnovodsk.

Homoptera penna, H. K. Morrison, P. Bost. Soc. xviii. p. 241, Illinois; *H. woodi*, A. R. Grote, l. c. p. 88, New York State.

Syneda alleni, id. l. c. p. 215, Maine.

Melipotis sinualis, L. F. Harvey, Canad. Ent. ix. p. 94, Texas.

Hypocala lativittata, F. Moore, l. c. p. 606, pl. lx. fig. 4, S. Andamans.

Catocala zalmunna and *nivea*, p. 241, *ella*, *bella*, and *jonasi*, p. 242, *mirifica*, *xarippe*, and *esther*, p. 243, and *volcanica*, p. 244, A. G. Butler, Cist. Ent. ii., all from Japan; *C. subviridis*, L. F. Harvey, l. c. p. 193, Texas; *C. augusta*, p. 184, *cleopatra*, p. 209, *perdita* and *hippolyta*, p. 211, California, *mariana*, p. 210, Vancouver Island, *luciana*, p. 211, Colorado, *cassandra*, p. 214, Mexico, H. Edwards, P. Cal. Ac. vi. [1875, dated 1876]; *C. traversi*, R. W. Fereday, Tr. N. Z. Inst. ix. p. 457, New Zealand.

Euclidia tehuelcha, C. Berg, Lep. Patag. pp. 84 & 221; *Pelamia tehuelcha*, id. An. Soc. Argent. iv. p. 204, Patagonia.

Blenina grisea and *lichenosa*, F. Moore, l. c. p. 607, pl. lx. figs. 1 & 2, S. Andamans.

Ophideres aurantia, id. l. c. p. 607, S. Andamans.

Potamophora neocheirina, Butler, Ent. M. M. xiv. p. 109, Queensland.

Sypna picta, p. 244, *achatina*, *fumosa*, and *fuliginosa*, p. 245, id. Cist. Ent. ii., all from Japan.

Spiredonia simplex, id. Ann. N. H. (4) xx. p. 358, Lifu.

Nyctipao truncata, F. Moore, l. c. p. 608, S. Andamans.

Calliodes lanipes, A. G. Butler, Ent. M. M. xiv. p. 109, Queensland.

Hypopyra persimilis, F. Moore, l. c. p. 608, S. Andamans.

Ophisma rectilinea, P. C. T. Snellen, l. c. p. 35, pl. ii. fig. 16, Java.

Achea nubifera, F. Moore, l. c. p. 609, pl. lix. fig. 9, S. Andamans.

Ophiura arcuata, id. l. c. p. 609, India, Ceylon, Java, and S. Andamans (= *O. joviana*, Guén., nec Cram., and = *O. myops*, Horsf., MS.).

Hypatra stigmata, id. l. c. p. 610, Andamans.

Euclidia hectori, A. G. Butler, P. Z. S. 1877, p. 387, pl. xlii. fig. 4, New Zealand.

Phurys glans, A. R. Grote, P. Bost. Soc. xviii. p. 416, Florida.

Iluzia pyralina, F. Moore, l. c. p. 610, S. Andamans.

Zethes sondaicus, P. C. T. Snellen, l. c. p. 38, pl. ii. fig. 17, Java.

Symphis turbida, F. Moore, l. c. p. 611, S. Andamans.

Cupnodes rufescens and *trifasciata*, id. l. c. p. 612, Andamans.

DELTOIDÆ.

Episparis signata, Walk., = *varialis*, Walk.; F. Moore, P. Z. S. 1877, p. 611.

Nodaria hispanalis, Guén. Transformations described, and larva and imago figured, by P. Millière, Icon. iii. pp. 415 & 416, pl. cli. figs. 10 & 11, *Zanclognatha tarsipennalis*, Tr., described in all stages; A. Fuchs, S. E. Z. xxxviii. pp. 138-143.

Orectis massiliensis, P. Millière, formerly referred by him to *Nola*, re-

figured, with remarks by Millière & Guénée; Icon. iii. pp. 333 & 334, pl. cxlii. fig. 8.

Pallachira, g. n., A. R. Grote, Canad. Ent. ix. p. 197. Allied to *Herminia*; type, *P. bivittata*, sp. n., p. 198, Buffalo.

New species :—

Madopa (?) *quadririgata*, P. C. T. Snellen, Tijdschr. Ent. xx. p. 73, pl. v. fig. 7, Sumatra.

Bomolocha opulenta, H. Christoph, Hor. Ent. Ross. xii. p. 258, pl. vii. fig. 29, Asterabad.

Herminia lilacina, A. G. Butler, P. Z. S. 1877, p. 388, pl. xlii. fig. 11, South Island, New Zealand.

Hypan obsoleta and *insignis*, id. Ent. M. M. xiv. pp. 47 & 48, Hawaiian Islands; *H. quinquelinealis*, p. 612, and *dentilinealis*, p. 613, pl. lx. fig. 7, F. Moore, P. Z. S. 1877, S. Andamans.

Cyclopteryx canaliferalis, id. l. c. p. 613, S. Andamans.

Rivula bioculalis and *oculalis*, id. l. c. p. 614, S. Andamans.

Hydrillodes sub-basalis, pl. lx., fig. 8, and *transversalis*, id. l. c. p. 613, Andamans.

Bertula albinotalis, id. l. c., Andamans.

GEOMETRIDÆ.

Packard's monograph of the *Geometridæ* is reviewed, with occasional remarks on some of the species, by H. B. Möschler, S. E. Z. xxxviii. pp. 414–426.

On assembling in *Geometræ*; B. G. Cole, Ent. x. pp. 140 & 141.

Caustoloma ? *ciczac*, Feld., = *Polygonia fortinata*, Guén., and *Selenia gallaria*, Walk., is closely related; *Teras punctilineana*, Walk., = (*Sestra*) *obtruncata*, Walk., is perhaps a var. of *Cidaria flexata*, Walk., = *Sestra fusiplagiata*, Walk.; *Macaria* ? *humeralia*, Walk. (? = *Lozogramma obtusaria*, Walk.), is also a *Sestra*; *Boarmia exprompta* and *Tephrosia patularia*, Walk., *Gnophos pannularia*, Guén., and *Scotopteryx maoriata*, *Hemerophila sulphurata*, and *H. caprimulgata*, Feld., all = *Boarmia dejectaria*, Walk.; *Tephrosia scriptaria*, Walk., = his *Scotosia stigmaticata*; *Acidalia tuhuota*, Feld., = *Asthena subpurpureata*, Walk.; *Asth. mullata*, Guén., = *Acid. pulcherrima*, Doubl.; *Fidonia* ? *acidaliaria*, Walk., = *Acid. ? rubraria*, Doubl.; *Acid. præfectata*, *subtentaria*, and *abscunditaria*, Walk., are all identical; *Panagra ephyraria* is congeneric with *Gargaphia muriferata*; *Fidonia brephos*, Feld., probably = *Larentia catocalaria*, Guén., and is a var. of *F. ? brephosata*, Walk.; *F. ? servularia*, Guén., = *Aspilates abrogata*, Walk., and is probably an *Acidalia*; *F. perornata* and *Camptogramma correlata*, Walk., *Dasyuris partheniata*, Guén., and *Cidaria rehata*, Feld., are congeneric; *Hybernia boreophilaria*, Guén., = *Zermizinga indocilisaria*, Walk.; *Larentia quadririgata* = *L. interclusa*; *Cidaria dissociata* and *semilisata*, Walk., and *Larentia corcularia*, Guén., = *L. semisignata*, Walk.; *C. adonata*, Feld., may = *L. invecata*, Walk., and belongs to the genus *Helastia*, with

which *Eupithecia indicataria*, Walk., *E. cidariaria*, Guén. (perhaps = *E. bilineolata*, Walk., which itself may = *indicataria*, var.), and *Coremia inamenaria*, Guén., and *Cidaria aquosata*, Feld. (both perhaps = *Eup. ? muscosata*, Walk.), are all congeneric; *Cor. pastinaria*, Guén., = *Cidaria rosearia*, Doubl.; *Cumtogramma fuscinata*, Guén., = *Aspilates ? subochraria*, Doubl., var.; *Phibalopteryx parvulata* and probably *Scotosia humeraria*, Walk., = his *S. denotata*; *S. panagrata* (variation noticed, pp. 396 & 397) belongs to *Hyperthyra*; *Cidaria pyramaria*, Guén., = *Larentia clarata*, Walk.; *C. delicatula*, Guén., = *Coremia semifissata*, Walk.; *Cid. assata*, Feld., = *Lar. megaspilata*, Walk.; *Cid. monoliata*, Feld., = *C. congregata*, Walk.; *Cidaria inopiata*, Feld., = *perductata*, var. Walk., and *C. timarata*, Feld., = *similata*, Walk.; *Sauris ranata*, Feld., = *Cid. lestevata*, Walk.; *Argua scabra*, Walk., may be a var. of his *Declana floccosa*. A. G. Butler, P. Z. S. 1877, pp. 389-398.

Aspilates sanguinaria and *Odesia tibialaria* recorded as new to France; *Pet. Nouv. ii. p. 133* (cf. N. Rebec, *tom. cit. p. 138*).

Acidalia imprinata, *Macaria obstataria*, and *Bithia lignaria*, Walk., = *B. (Hemerophila) exclusa*, Walk.; F. Moore, P. Z. S. 1877, p. 621.

Urapteryx geminia, Cram. J. Kirsch describes varr. *jobincola* and *destrigata* from New Guinea; MT. Mus. Dresd. i. p. 133.

Endropia homuraria, Grote & Rob., is distinct from *duaria*, Pack.; A. R. Grote, Canad. Ent. ix. p. 89.

Metrocampa honoraria, W. V. Transformations figured and described by P. Millière, Icon. iii. pp. 216-219, pl. cxxiii. figs. 8-11. *M. margaritaria*, Linn.: notes on larva; Snellen Van Vollenhoven, Tijdschr. Ent. xx. pp. xiii. & xiv.

Ellopia prosapiaria, Linn., ab. *prasinaria*, Hübn., and ab. *grisearia*, from Nassau, noticed; A. Fuchs, S. E. Z. xxxviii. pp. 143 & 144.

Tetracis lorata, Grote. Larva described; L. W. Goodell, Canad. Ent. ix. p. 62.

Pleurola falcata, Walk., figured; F. Moore, l. c. pl. lx. fig. 6.

Nyssia zonaria. On its distribution in Britain; N. Ooque, Ent. x. pp. 215 & 216. On rearing; C. F. Thornehill, *op. cit. p. 258*.

Biston hirtarius. Both sexes appear to have the habit of "assembling"; H. Silcock, Ent. M. M. xiv. p. 43. *B. pomonarius*, Hübn., hermaphrodite described and figured by De Peyerimhoff; Millière, Icon. iii. p. 327, pl. cxli. fig. 6.

Cleora glabraria. Variety figured and described; H. Goss, Ent. x. p. 289.

Hyperthyra limbolaria and *penicillaria*, Guén., and *susceptaria*, Walk., = *H. lutea*, Cram.; F. Moore, P. Z. S. 1877, p. 620.

Hypochroma nyctemerata, Walk., = *perfectaria*, Walk.; *id. l. c. p. 621*.

Boarmia selenaria, W. V., pp. 257-259, figs. 1-3, *consimiliaria*, Dup., pp. 230 & 261, figs. 7-9, *rhomboidaria*, pp. 261 & 262, fig. 6 (larva only), and *umbraria*, Hübn., pp. 262-264, figs. 4 & 5. Transformations described and figured by P. Millière, Icon. iii. pl. cxxx. *B. cinctaria*: transformations described; W. Buckler, Ent. M. M. xiv. pp. 83-85.

Tephronia oppositaria, Mann, noticed and figured by P. Millière, Icon. iii. p. 391, pl. cxlix. fig. 2.

Dasydia wockearia, Staud. Transformations figured and described; *id. l. c.* pp. 426-428, pl. cliii. figs. 1-5.

Geometra smaragdaria, Fabr. Transformations, and var. *gigantea* from Spain described and figured; *id. l. c.* pp. 423-425, pl. clii. figs. 16-18. *G. volgaria*, Guén., ♀ described and figured; *id. l. c.* p. 425, pl. clii. fig. 19.

Pseudoterpna cytisaria. Larvæ found feeding on *Ulex europæus*; J. Hellins, Ent. M. M. xiv. p. 113. Note on food-plant; W. Machin, Ent. x. p. 74.

Iodis vernaria assembling; B. Cooper, Ent. x. p. 74.

Ephyra orbicularia and *omicronaria*. Transformations described; G. T. Porritt, Ent. x. pp. 97, 98, & 137.

Ephyra punctaria is apparently dimorphous; B. G. Cole, P. E. Soc. 1877, pp. vi. & vii.

Ephyra myrtaria, Guén. Larva described; L. W. Goodell, Canad. Ent. ix. p. 62.

Bursada basistriga, Walk. Its variation noticed by J. Kirsch, MT. Mus. Dresd. i. p. 133.

Asthena sylvata. Transformations described; J. Hellins, *l. c.* xiii. pp. 213-215.

Venusia cambricaria, hermaphrodite; A. J. Spiller, Ent. x. p. 48.

Acidalia cervantaria, Mill., pp. 195-197, figs. 1-5; *isabellaria*, Mill., pp. 202 & 203, figs. 16-18, pl. cxxi.; *A. strigilaria*, W. V., pp. 341-343, figs. 1 & 2; *contiguaria*, Hübn., pp. 343 & 344, figs. 3 & 4; *confnaria*, Herr. Schöff., pp. 344-346, pl. cxliii. figs. 5 & 6; *emularia*, Hübn., pp. 346 & 347, figs. 7 & 8; and *vesubiata*, Mill., pp. 347-349, figs. 9-11. Pl. cxliii., Transformations figured and described by P. Millière, Icon. iii. He also (*l. c.* pp. 200 & 201, pl. cxxi. figs. 12-15), notices and figures varieties of *A. helianthemata*, and remarks that he has previously (*l. c.* ii. pl. lxxvi. fig. 6), figured another variety as *obsoletaria* (nec Zell.). *A. subtilata*, Christoph, noticed and figured; *id. l. c.* p. 271, pl. cxxxii. fig. 9.

Zanclopteryx, Guén. Characters and species discussed by P. C. T. Snellen, Tijdschr. Ent. xx. pp. 75 & 76.

Stegania permutaria, Hübn.; Pet. Nouv. ii. pp. 106 & 107.

Strenia clathrata, varieties figured; Ent. x. p. 241.

Tephrosia disconventa, Walk., = his *Cidaria lactispargaria*, and is perhaps a *Lozogramma*; A. R. Grote, Canad. Ent. ix. pp. 89 & 90.

Aspilates pervaria, Pack., var. *interminaria* from Texas described; *id. l. c.* p. 90. *A. purpuraria* and *citraria* noticed; Pet. Nouv. ii. p. 134.

Euschema. Walker's *E. discalis*, *subrepleta* (= *E. bellonaria*, Guén.), and *flavescens*, p. 57, and *bellona*, p. 58, figured and redescribed by A. G. Butler, Ill. Lep. Het. i. pl. xiv. figs. 1, 4, 3, & 5.

Eufstichia ribearia, Fitch. Transformations figured and described by C. V. Riley, Rep. Ins. Mo. ix. pp. 3-7.

Declana floccosa, Walk., is not a *Noctua*, but a *Geometra* allied to *Ligia*: it is congeneric with *Chlenias verrucosa*, Feld., which is not a true *Chlenias*; A. G. Butler, P. Z. S. 1877, p. 382.

Anisopteryx æscularia and *pometaria*, with description of transforma-

tions of the latter; the two species are distinct. J. Hellins, Ent. M. M. xiv. pp. 113 & 114.

Chimatobia boreata, ♀ noticed; Snellen Van Vollenhoven, Tijdschr. Ent. xx. pp. xiv. & xv.

Oporabia. F. B. White discusses the British species, and figures the various forms; Scot. Nat. iv. pp. 111-116, 158-160, pl. i. He gives the synonymy as follows: 1, *dilatata*, Borkh., and ab. *obscurata*; 2, *autumnata*, Boisd., probably not British; 3, *addendaria*, White (p. 160), = *autumnaria*, Doubl., &c.; and 4, *filigrammaria*, Herr. Schöff.

Larentia inculitaria, Herr. Schöff., var. *latifoliata*, from *Celerina*, described and figured in all stages by P. Millière, Icon. iii. pp. 432-434, pl. cliii. figs. 16-19.

Eupithecia. C. Dietze continues his observations on this genus, S. E. Z. xxxviii. pp. 98-100, and states that *E. heydenaria*, Staud., = *distinctaria*, Herr. Schöff., but *extravasaria*, H. S., = *libanotidata*, Schleich, is distinct; the larvæ described in 1875, p. 236, as those of *strobilata*, Hüb., = *abietaria*, Goeze, have produced *togata*, Hüb.; and those described 1874, p. 216, and figured 1875, pl. i. figs. 5 & 6, as those of a *Eupithecia*, prove to be those of *Cidaria alpicolata*, H. S. P. Millière redescribes and figures his *E. primulata* (including larva), p. 7, figs. 1-4, *coscurata*, p. 8, fig. 5, *pantellaria* and *mnemosynata* (with note on larva), p. 9, figs. 6 & 7, and *incertata*, p. 11, fig. 8; Ann. Soc. Ent. Fr. (5) vii. pl. i. He also (Icon. iii.) redescribes and figures the following species, mostly with their larvæ: *massiliata*, Mill., pp. 215 & 216, pl. cxliii. figs. 6 & 7, *ultimaria*, Boisd., pp. 236 & 237, pl. cxvi. figs. 1-4, *magnata*, Mill., pp. 309 & 310, pl. cxxxix. fig. 3, *provinciata*, Mill. & De Peyerimhoff, pp. 400-402, figs. 5-8, *lentoscata*, Mill., p. 403, fig. 12, *subciliata*, Guén., pp. 404 & 405, figs. 13 & 14, pl. cl. *E. absinthiata*, Linn.: larva described; L. W. Goodell, Canad. Ent. ix. p. 62. *E. minutata*, and var. *knautiata*, larvæ, p. 185; *E. albipunctata*, var. *angelicata*, described, p. 272; C. G. Barrett, Ent. M. M. xiii. *E. subciliata*, transformations described; G. T. Porritt, op. cit. xiv. p. 68.

Lobophora hexapterata. Transformations described; J. Hellins, l. c. xiii. p. 249. *L. viretata*: transformations described; W. Buckler, Ent. M. M. xiii. pp. 185-187. It is double-brooded; Jones & Barrett, op. cit. pp. 209 & 231. Note on food-plants; G. C. Bignell, Ent. x. p. 98.

Scordylia humeraria and *perfectaria*, Walk., and *salvini*, Butl., figured and redescribed by A. G. Butler, Ill. Lep. Het. i. p. 60, pl. xx. figs. 8-10.

Coremia propugnata. Transformations described: G. T. Porritt, Ent. M. M. xiii. p. 213.

Melanippe oxybiata, Mill., pp. 264 & 265, 414, pl. cxxi. figs. 1-3, and pl. cli. fig. 9, *thulearia*, Herr. Schöff., pp. 266 & 267, figs. 4-6, and *fluctuata*, var. *neapolisata*, pp. 267 & 268, fig. 7 (imago only), pl. cxxxi., *gentianata*, Mill. & Zell., pp. 411-414, pl. cli. figs. 1-8. Transformations figured and described by P. Millière, Icon. iii.

Camptogramma? *uniformata*, Bell. Larva, pupa, and a variety described and figured by P. Millière, Icon. iii. pp. 175-177, pl. cxvii. figs. 6-8.

Coremia propugnata. Transformations described; G. T. Porritt, Ent. M. M. xiii. p. 213.

Cidaria fulvata, var. from the Isle of Man, figured by F. Bond, Ent. x. p. 120. *C. immanata*, rearing; F. O. Standish, Ent. x. pp. 257 & 258. *C. vespertaria*, Borkh.: transformations described; A. Fuchs, S. E. Z. xxxviii. pp. 144-146. *C. russata*, varr. *perfuscata* and *commutata*, Haw., have been figured by P. Millière as varr. of *C. immanata*; Millière & Doubleday, Icon. iii. p. 171, note, pl. cxi. figs. 7 & 8.

Lithostege griseata, W. V., and *Anaitis simplicitata*, Tr. Transformations described and figured by P. Millière, Icon. iii. pp. 243 & 244, pl. cxxvii. figs. 6-9, pp. 361-363, pl. cxlv. figs. 1-5.

Eratina cometaria and *discalis*, A. G. Butler, figured and redescribed, Ill. Lep. Het. i. p. 61, pl. xx. figs. 6 & 7.

New genera and species :—

Psychostrophia, A. G. Butler, Ann. N. H. (4) xx. p. 401. Allied to *Bursada*; type, *P. melanargia*, sp. n., l. c., Japan.

Pseudocoremia, id. P. Z. S. 1877, p. 394. Allied to *Boarmia*; to contain *Selidosema* ? *fragosata*, Feld., and *P. indistincta*, sp. n., l. c. pl. xliii. fig. 8, South Island, New Zealand.

Cacopsodos, id. l. c. p. 395. Affinities uncertain; type, *C. niger*, sp. n., l. c. pl. xliii. fig. 4, South Island, New Zealand.

Meskea, A. R. Grote, Canad. Ent. ix. p. 114. Allied to *Tornos*; type, *M. dyspteraria*, sp. n., l. c. p. 115, Texas.

Glacies, P. Millière, Icon. iii. p. 429. Allied to *Dasydia*; type, *D. albicolaria*, Mann. (transformations described, and larva and varieties figured), l. c. pp. 429 & 430, pl. cliii. figs. 6-9.

Oxydia korndorfferi, P. C. T. Snellen, Tijdschr. Ent. xx. p. 73, pl. v. figs. 8 a, b, Sumatra.

Gonodontis felix, A. G. Butler, P. Z. S. 1877, p. 389, pl. xlii. fig. 10, South Island, New Zealand.

Fascellina castanea, F. Moore, P. Z. S. 1877, p. 612, S. Andamans.

Omiza affinis, id. l. c. p. 621, S. Andamans.

Zomia pallida, id. l. c. p. 622, S. Andamans.

Amblychia torrida, F. Moore, id. l. c. p. 621, S. Andamans.

Gnophos creperaria, N. Erschoff, Hor. E. Russ. xii. p. 337, Irkutsk.

Boarmia concentraria, P. C. T. Snellen, Tijdschr. Ent. xx. p. 40, pl. iii. fig. 20, Java; *B. acutaria*, id. l. c. p. 75, pl. v. figs. 1 & 2, Sumatra; *B. lichenina*, A. G. Butler, Ann. N. H. (4) xx. p. 358, Lifu, Loyalty Group; *B. subflavaria*, P. Millière, Ann. Ent. Belg. xx. pp. 60 & 61, pl. i. figs. 14-16, Alpes Maritime.

Tephronia fingsalata, P. Millière, Icon. iii. p. 389, pl. cxlix. fig. 1, Alpes Maritimes.

Tornos infumatoria, A. R. Grote, Canad. Ent. ix. p. 90, Texas.

Geometra rectaria, id. l. c. p. 157, Texas.

Euchloris procumbaria, W. B. Pryer, Cist. Ent. ii. p. 232, pl. iv. fig. 2, Shanghai.

Nemoria pretiosaria, O. Staudinger, S. E. Z. xxxviii. p. 202, Southern Caucasus.

- Iodis norbertaria*, A. Rössler, S. E. Z. xxxviii. p. 365, Bilbao.
- Eumelea gemina*, J. Kirsch, MT. Mus. Dresd. i. p. 133, pl. vii. fig. 13, New Guinea.
- Bursada salamandra*, id. l. c. fig. 9, New Guinea.
- Acidalia seeboldiata* and *subherbariata*, A. Rössler, l. c. p. 366, Bilbao ; *A. eulonata* (Hagenbach, MS.), P. C. T. Snellen, l. c. p. 42, pl. iii. fig. 21, Java ; *A. nivea*, J. Kirsch, l. c. p. 134, pl. vii. fig. 10, New Guinea ; *A. alyssumata*, p. 197, pl. cxi. figs. 6-11, Barcelona and Cannes, *zephyrata*, p. 268, pl. cxxxii. figs. 1-8, Cannes, and *cassandrata*, p. 382, pl. cxlviii. fig. 1, St. Martin-Lantosque.
- Hydata spectabilis*, A. G. Butler, P. Z. S. 1877, p. 474, Cape York.
- Micronia adpersata*, P. C. T. Snellen, l. c. p. 43, pl. iii. fig. 22, Java ; *M. obliquaria*, S. Andamans and Darjeeling, and *vagata*, S. Andamans ; F. Moore, P. Z. S. 1877, p. 622, pl. lx. figs. 17 & 18 ; *M. (Strophidia) titania*, J. Kirsch, l. c. p. 134, pl. vii. fig. 11, New Guinea.
- Erosia* ? *plicata*, P. C. T. Snellen, Tijdschr. Ent. xx. p. 44, pl. iii. fig. 23, Java.
- Numeria* ? *fulvo-capitata*, id. l. c. p. 45, pl. iii. figs. 24 a & b, Java.
- Fidonia enysi*, p. 391, pl. xlii. fig. 9, *anceps*, pl. xliii. fig. 3, *ferox*, pl. xlii. fig. 8, and *F. ? catapyrrha*, pl. xliii. fig. 2, p. 392 ; A. G. Butler, l. c., New Zealand.
- Cleogene opulentaria*, O. Staudinger, l. c. p. 203, Caucasus.
- Aspilates cruciferaria*, C. Berg, An. Soc. Argent. iv. p. 205, Patagonia ; *A. glossaria*, H. Christoph, Hor. Ent. Ross. xii. p. 259, pl. vii. fig. 30, Krasnovodsk ; *A. insignis*, A. G. Butler, l. c. p. 393, pl. xliii. fig. 1, New Zealand.
- Declana feredayi*, id. l. c. p. 398, pl. xliii. fig. 5, Christchurch, New Zealand.
- Euschema andamana* and *rapstorffi*, F. Moore, l. c. pp. 599 & 600, S. Andamans.
- Eusarca vastaria*, figs. 31 & 32, Krasnovodsk, and *cuprinaria*, fig. 33, Schahkuh ; H. Christoph, l. c. p. 261, pl. vii.
- Eupithecia sutiliata*, id. l. c. p. 262, pl. vii. fig. 34, Schahkuh ; *E. mnemosynata*, P. Millière, Ann. Ent. Belg. xx. pp. 65 & 66, pl. i. figs. 1-3, Cannes. *E. ? fenestrata*, id. Icon. iii. p. 431, pl. clii. figs. 14 & 15, Alpes Maritimes.
- Cidaria beata*, A. G. Butler, P. Z. S. 1877, p. 397, pl. xliii. fig. 6, South Island, New Zealand ; *C. deflorata* and *incurvaria* ; N. Erschoff, Hor. E. Russ. xii. pp. 338 & 339, Irkutsk.
- Ortholitha alpheraki*, id. l. c. p. 338, Russian Armenia.
- Carsia uniformata*, C. Berg, l. c. p. 208, Patagonia.
- Lithostege castiliaria*, O. Staudinger, l. c. p. 204, Castile.
- Stamnodes danilovi*, N. Erschoff, l. c. p. 338, S. W. Siberia.

PYRALIDÆ.

Scopula quadralis, Doubl., and *dipsasalis*, Walk., are probably vars. of *flavidalis*, Doubl. ; *Botys otagalus*, Feld., is allied but distinct ; *B. maorialis*, Feld., is perhaps a var. of *Mecyna ornithopteris*, Guén. ; *Sco-*

paria feredayi and *ejuncida*, Knaggs, = *Hypochalcia submarginalis* and *indistinctalis*, Walk., respectively : A. G. Butler, P. Z. S. 1877, pp. 388 & 389.

Botys mahanga, Feld., = *Gadira acerella*, Walk.; *Crambus rangona*, Feld., may = *C. ramosellus*, Doubl., var.; *C. gracilis*, Feld., = *Eromene auriscriptella*, Walk.; *Adena xanthialis*, Walk., belongs to the *Hyphenidæ*; *id. l. c.* pp. 399-402.

Hypopygia egregialis, P. Herr. Schöff., var. P. *medusalis*, from Cannes, noticed and figured by P. Millière, Icon. iii. pp. 242 & 243, pl. cxxvii. figs. 4 & 5.

Pyrallis pulchellalis, P. Millière : described and figured by him; Icon. iii. pp. 443 & 444, pl. cliv. figs. 7 & 8. *P. farinalis* in the Yorkshire collieries; H. Vaughan, Ent. M. M. xiv. p. 141.

Stemmatophora corsicalis, Dup., noticed and refigured by P. Millière, Icon. iii. pp. 409 & 410, pl. cl. fig. 21.

Pyrausta falcatalis, F. v. Rössl., new to France, noticed and figured; *id. l. c.* p. 444, pl. cliv. fig. 9.

Agrotera nemoralis double-brooded : the second brood is duller, as is also the case with other insects, when they feed up faster than usual; W. H. Tugwell, Ent. x. pp. 48 & 49.

Stenia carnealis, Tr., var. ? from the Alpes Maritimes described and figured by P. Millière, Icon. iii. pp. 410 & 411, pl. cl. figs. 22 & 23.

Diasemia litalis. Habits; C. G. Barrett, Ent. M. M. xiv. pp. 159 & 160.

Hydrocampa stagnalis. Transformations described; W. Buckler, *tom. cit.* pp. 97-103.

Margarodes leodicealis, Walk., = *Cydalima laticostalis*, Guén.; F. Moore, P. Z. S. 1877, p. 618.

Zebronia salomealis and *Botys annuligeralis*, Walk., = *B. multilinealis*, Guén.; *B. disjunctalis*, Walk., = *scinisalis*, Walk., fig. 11; *B. thoasalis*, Walk., fig. 16; *B. retractalis*, Walk., = *abstrusalis*, Walk.: *id. l. c.* pp. 619 & 620, pl. lx.

Eriusa. Walker's *E. dioptalis*, p. 61, *dioptoides*, *cyanea*, and *croceipes*, p. 62, figured and redescribed by A. G. Butler, Ill. Lep. Het. i. pl. xx. figs. 1-4.

Erocha discreta, Walk., figured and redescribed; *id. l. c.* p. 62, pl. xx. fig. 5.

Botys auralis, De Peyerimhoff, figured and redescribed by him in Millière's Icon. iii. pp. 325-327, pl. cxli. figs. 1-3. *B. thyanalis*, Walk., = *Coptobasis lunalis*, Guén.; F. Moore, *l. c.* p. 616. *B. vibicalis*, Zell., and *onythesalis*, Walk., redescribed; A. R. Grote, Canad. Ent. ix. pp. 103 & 104. *B. trinalis*, Hübn., var. *bornicensis*, A. Fuchs, noticed by him; S. E. Z. xxxviii. pp. 146 & 147. *B. opacalis*, Hübn., transformations described; Mann & Rogenhofer, Verh. z.-b. Wien, xxvii. p. 496.

Ebulea crocealis, Tr., var. ? *oxybialis*, Mill., p. 286, figs. 4 & 5, and *catalaunalis*, Dup., pp. 287 & 288, figs. 6-8, figured and redescribed, the latter with transformations, by P. Millière, Icon. iii. pl. cxxxv. *E. stachydalis* and *sambucalis* figured, and their differences pointed out, by J. T. Carrington, Ent. x. pp. 81 & 82: habits of *E. stachydalis* noticed; C. G. Barrett, Ent. M. M. xiv. p. 159.

Orobena ? isatidalis, Dup. Transformations described and figured by P. Millière, Icon. iii. pp. 240-242, pl. cxxvii. figs. 1-3.

Scopula institalis, Hübn.: transformations described and figured, *id. l. c.* pp. 319 & 320, pl. cxl. figs. 7-9. *S. lutealis*: larva described; G. T. Porritt, Ent. M. M. xiv. pp. 114 & 115.

Udea ferrugalis, Hübn. Transformations described; Pet. Nouv. ii. pp. 170 & 171.

Stenopteryx hybridalis. Transformations described; G. T. Porritt, *l. c.* pp. 160 & 161.

New species :—

Noctuella alticolalis, H. Christoph, Hor. Ent. Ross. xii. p. 268, pl. vii. fig. 39, Schahkuh and Taschkend.

Pyrallis trifascialis, pl. lx. fig. 9, and *ochrealis*, F. Moore, P. Z. S. 1877, p. 614; *P. achatina*, A. G. Butler, Ent. M. M. xiv. p. 49, Hawaiian Islands.

Hypotia ? russulalis, H. Christoph, *l. c.* p. 263, pl. vii. fig. 35, Schahkuh. *Noctuomorpha magnificalis* and *modestalis*, *id. l. c.* pp. 266 & 267, pl. vii. figs. 37 & 38, both from Krasnovodsk.

Pyrausta minnehaha, W. B. Pryer, Cist. Ent. ii. p. 234, pl. iv. fig. 9, North China and Japan.

Rhodaria despecta, A. G. Butler, *l. c.* p. 49, Hawaiian Islands.

Anthophilodes plumbiferalis, p. 270, *erubescens* and *turcomanica*, p. 271, all from Krasnovodsk; H. Christoph, *l. c.* pl. vii. figs. 40-42.

Coptobasis andamanalis and *cuprealis*, F. Moore, *l. c.* pp. 615 & 516, pl. lx. figs. 14 & 13, S. Andamans.

Samea cuprinalis and *purpurascens*, *id. l. c.* p. 615, S. Andamans.

Asopia limbolalis, *id. l. c.*, S. Andamans; *A. obatralis*, H. Christoph, *l. c.* p. 264, pl. vii. fig. 36, Krasnovodsk.

Stenia intervacutalis, *id. l. c.* p. 276, pl. vii. fig. 47, Schahrud.

Oligostigma insectalis and *regularis*, W. B. Pryer, *l. c.* p. 234, pl. iv. figs. 7 & 8, Shanghai; *O. secpunctalis*, pl. lx. fig. 12, and *parvalis*, F. Moore, *l. c.* p. 616, S. Andamans.

Cataclysta sabrina and *bifurcalis*, W. B. Pryer, *l. c.* p. 262, pl. iv. figs. 3 & 4, Snowy Valley, Chekiang Province, China.

Hydrocampa interruptalis and *nigro-linealis*, *id. l. c.* p. 233, pl. iv. figs. 5 & 6, Shanghai.

Lepyrodes bistigmalis and *fengwhanalisis*, *id. l. c.* pp. 234 & 235, Shanghai.

Conchylodes æriferalis, F. Moore, *l. c.* p. 618, S. Andamans.

Pachyarches tibialis, *id. l. c.*, Calcutta and S. Andamans.

Glyphodes westermanni, P. C. T. Snellen, Tijdschr. Ent. xx. p. 77, pl. vi. fig. 3, Sumatra; *G. marginalis*, F. Moore, *l. c.* p. 618, pl. lx. fig. 15, S. Andamans.

Pyncnarmon discinotalis, *id. l. c.* p. 617, S. Andamans.

Gonocausta invertalis, P. C. T. Snellen, *l. c.* p. 78, pl. vi. fig. 4, Sumatra.

Hyrmina traili, A. G. Butler, Ill. Lep. Het. i. p. 56, pl. xix. fig. 9, Manaos.

Botis langdonalis, Ohio, p. 10, *atro-purpuralis*, Texas, and *harveyana*,

New York and Texas, p. 104, *flavidissimalis*, Texas, and *catocalalis*, California, p. 105, *totalis*, Texas, ?, and *penumbralis*, Ohio, p. 106, *socialis*, Canada, and *allectalis*, Texas, p. 107; A. R. Grote, Canad. Ent. ix. *B. capparidis*, Schahrud, var. *daghestanica*, and *B. ustrinalis*, from Derbent; H. Christoph, l. c. pp. 272-274, pl. vii. figs. 43-45. *B. blackburni* and *accepta*, A. G. Butler, Ent. M. M. xiv. pp. 48 & 49, Hawaiian Islands. *B. vinacealis* and *opalinalis*, F. Moore, l. c. pp. 619 & 620, S. Andamans. *Eurycreon scalaralis*, H. Christoph, l. c. p. 275, pl. vii. fig. 46, Krasnovodsk.

Orobena manglisalis, N. Erschoff, Hor. Ent. Ross. xii. p. 339, Transcaucasia.

CRAMBIDÆ.

Ephestia polyxenella, P. Millière, figured and redescribed by him; Icon. iii. pp. 285 & 286, pl. cxxxv. figs. 2 & 3. *E. elutella* destructive to chicory; W. Prest, Ent. x. pp. 212 & 213.

Nephoteryx saturella, P. Millière, transformations figured and described, Icon. iii. pp. 349-351, pl. cxliv. figs. 1-4.

Myelois bituminella, Mill. & De Pey., pp. 351 & 352, figs. 9-11, and *astericella*, Mill., pp. 353 & 354, figs. 5-8. Transformations figured and described; id. l. c. pl. cxliv.

Gynancycla cinerella, Dup., has been described and figured by P. Millière as *Ancylosis cinnamomella*, Dup., Icon. iii. pp. 158 & 171, pl. cxv. figs. 15-19.

Elasmopalpus angustellus, Blanch., = *Pempelia lignosella*, Zell. C. Berg, Bull. Mosc. lii. p. 20; An. Soc. Argent. iv. p. 209.

Pempelia formosa, Haw. Habits of larva noticed; H. T. Stainton, Ent. M. M. xiv. pp. 138 & 139. *P. mellogamella*, C. Berg, noticed by him; Bull. Mosc. lii. p. 19.

Crambus oxybiellus, P. Millière, figured and described by him; Icon. iii. pp. 284 & 285, pl. cxxxv. fig. 1.

Albinia, g. n., G. Briosi, Atti della Staz. Chimico-Agraria Sperimentale in Palermo, i. p. 61. Belongs to the *Phycidæ*; type, *A. wockiana*, sp. n., Palermo.

New species:—

Scoparia gallica, De Peyerimhoff, Millière's Icon. iii. p. 338, pl. cxlii. figs. 3 & 4, Colmar.

Aphomia strigosa, A. G. Butler, P. Z. S. 1877, p. 393, pl. xliii. fig. 10, South Island, New Zealand.

Euzophera rhenanella, A. Fuchs, S. F. Z. xxxviii. p. 147, Nassau.

Catastia ? umbrosella, Irkutsk, and *C. pyraustoides*, Irkutsk and Kiachta; N. Erschoff, Hor. Ent. Ross. xii. pp. 339 & 340.

Hypochalcia corrupta, A. G. Butler, P. Z. S. 1877, p. 399, pl. xliii. fig. 9, South Island, New Zealand; *H. caminariella*, H. Erschoff, l. c. p. 340, Irkutsk.

Eucarphia (Megasis) gregariella, id. l. c., Irkutsk.

Nephoteryx (Dioryctria) zimmermani, A. R. Grote, Rep. E. Soc. Ont.

1877, pp. 13 & 14; *Canad. Ent. ix.* pp. 161-163. Described in all stages; injurious to different species of pines in North America.

Nephoteryx validella, H. Christoph, *Hor. Ent. Ross. xii.* p. 278, pl. vii. figs. 49 & 50, Krasnovodsk.

Ephestia egeriella, P. Millière, *Icon. iii.* p. 328, pl. cxli. figs. 4 & 5, Cannes;

Pempelia prœtextella, H. Christoph, *l. c.* p. 279, pl. viii. fig. 51, Krasnovodsk.

Epischnia staminella and *sulcatella*, *id. l. c.* pp. 281 & 282, pl. viii. figs. 52 & 53, both from Krasnovodsk.

Myelois staudingeri, Schahrud, *terstrigella* and *cinctipalpella* (Zell., MS.), Krasnovodsk, *substratella*, Sarepta and Krasnovodsk, *M. (?) pollinella* (= *vestaliella*, Ersch., note), Krasnovodsk, *solskii*, Hadschyabad and Schahkuh, and *sieversi*, Krasnovodsk; *id. l. c.* pp. 282-288, pl. viii. figs. 54-60.

Crambus vapidus, p. 399, and *vulgaris*, p. 400, pl. xliii. fig. 7, A. G. Butler, P. Z. S. 1877, South Island, New Zealand; *C. interruptellus*, A. R. Grote, *Canad. Ent. ix.* p. 101, Canada; *C. euryptellus*, C. Berg, *An. Soc. Argent. iv.* p. 208, Patagonia.

Chilo simplex, pl. xliii. fig. 12, and *leucanialis*, A. G. Butler, *l. c.* pp. 400 & 401, South Island, New Zealand.

Eromene metallifera, *id. l. c.* p. 401, pl. xliii. fig. 11, New Zealand;

E. ? subscissa, H. Christoph, *l. c.* p. 277, pl. vii. fig. 48, Krasnovodsk.

Samana acutata, A. G. Butler, *l. c.* p. 401, South Island, New Zealand. (This genus probably belongs to the *Pyralideæ*.)

TORTRICIDÆ.

Notes on the *Tortrices* of Pembrokeshire (chiefly relating to their variation and habits; C. G. Barrett, *Ent. M. M. xiii.* pp. 220-223. On variation in the *Tortrices*; *id. l. c.* pp. 252 & 253.

Terus oblongana and *inaptana*, Walk., are probably varieties, and his *T. servana*, *prisana*, and *contractana* are probably synonymous; A. G. Butler, P. Z. S. 1877, p. 402.

Cnectra pilleriana, W. V. Larva described, and figured with the imago, by P. Millière, *Icon. iii.* pp. 330 & 331, pl. cxlii. figs. 1 & 2.

Tortrix angustiorana, Haw., pp. 422 & 423, pl. clii. figs. 9-13, and *T. steineriana*, Hübn., var. *? stelviana*, from the Stelvio, pp. 344 & 435, pl. cliii. figs. 11-14. Transformations figured and described; *id. l. c.* *T. viburnana*: food-plant; W. Prest & F. O. Standish, *Ent. x.* pp. 49, 74, & 75.

Pedisca rufimitrana, Herr. Schöff., recorded as new to Britain, and re-described; E. Meyrick, *Ent. M. M. xiii.* pp. 187 & 188.

Sciaphila penziana, Hübn. Transformations described and figured by P. Millière, *Icon. iii.* pp. 352 & 353, pl. cxli. figs. 5-7. *S. wahlbomiana*, Linn., var. *humerala*, from France, described by De Peyerimhoff, *Pet. Nouv. ii.* p. 101.

Orthotenia antiquana, note on larva; W. Shaw, *Ent. x.* p. 23.

Phtheochroa rugosana Hübn. Transformations figured and described; P. Millière, *Icon. iii.* pp. 334-336, pl. cxlii. figs. 9-11.

Retinia amethystana, De Peyerimhoff, figured and redescribed by him in Millière's Icon. iii. pp. 336 & 337, pl. cxlii. fig. 72.

Grapholitha cumulana, Guén., redescribed; De Peyerimhoff, Pet. Nouv. ii. p. 101.

Eudemis quaggana, Mann. Transformations figured and described; P. Millière, Icon. iii. pp. 420 & 421, pl. clii. figs. 4-7.

Steganoptycha minutana, Hübner. Transformations figured and described; id. l. c. pp. 255-257, pl. cxxix. figs. 1-3.

Dichrorampha. Notes on various species; J. B. Hodgkinson, Ent. x. pp. 23 & 24.

Leptogramma boscana and *scabrana* are broods of one species; C. G. Barratt, Ent. M. M. xiv. p. 160; W. West, Ent. x. pp. 303 & 304.

Peronea favillaceana and *abildgaardana*; Pet. Nouv. ii. p. 110.

Phthoroblastis albuginana, Guén., redescribed by De Peyerimhoff, l. c. p. 102.

Ecentera, g. n., A. R. Grote, Canad. Ent. ix. p. 227. Allied to *Chimatomphila*; type, *E. apriliana*, sp. n., *ibid.*, Albany.

New species:—

Chimatomphila praviella, N. Erschoff, Hor. Ent. Ross. xii. p. 341, Irkutsk.

Teras ænea and *flavescens*, A. G. Butler, P. Z. S. 1877, p. 402, New Zealand.

Tortrix (Ptycholoma) erschoffi, Asterabad, and *T. (Heterognomon) verbascana*, Schahrud, H. Christoph, Hor. Ent. Ross. xii. pp. 289 & 290, pl. viii. figs. 61 & 62; *T. (Idiographis) excentricana*, N. Erschoff, l. c. p. 341, Irkutsk.

Penthina enervana, id. l. c., Irkutsk.

Cacœcia vilis, fig. 15, and *inana*, fig. 13, A. G. Butler, l. c. pp. 402 & 403, pl. xliiii., New Zealand.

Amphypsa seeboldiana, A. Rössler, S. E. Z. xxxviii. p. 371, Bilbao.

Zelotheres ? *robusta*, A. G. Butler, l. c. p. 403, pl. xliii. fig. 17, Canterbury, New Zealand.

Cochylis dorpatensis, F. Sintenis, Arch. Nat. Livl. (2) vii. p. 262, Dorpat (cf. also SB. Ges. Dorp. 1875, p. 28); *C. deaurana*, *rubricana*, and *millieriana*, De Peyerimhoff, Pet. Nouv. ii. p. 101, Cannes; *C. zelleri*, H. Christoph, l. c. p. 290, pl. viii. fig. 63, Krasnovodsk; *C. (Phtheochroa) pistrinana*, N. Erschoff, l. c. p. 341, Irkutsk.

Grapholitha oxycedrana, pp. 61 & 62, figs. 12 & 13, and *opulentana*, pp. 62 & 63, figs. 9-11, described in all stages, with figures of larvæ and imagines by P. Millière, Ann. Ent. Belg. xx. pl. i., Cannes; *G. oxycedrana* is redescribed by De Peyerimhoff, Pet. Nouv. ii. p. 102; *G. fuchsiana*, A. Rössler, l. c. p. 75, Bornich; *G. seeboldi*, id. l. c. p. 373, Bilbao; *G. abacana* and *subterminana*, N. Erschoff, l. c. p. 342, Irkutsk; *G. ephedrana*, H. Christoph, l. c. p. 291, pl. viii. fig. 64, Schahrud.

Steganoptycha ? *negligens*, A. G. Butler, l. c. p. 404, pl. lxiii. fig. 18, Canterbury, New Zealand.

Phthoroblastis dorsilunana, N. Erschoff, l. c. p. 342, Irkutsk.

TINEIDÆ.

V. T. Chambers enumerates 79 *Tineina* as occurring in Colorado, including many described as new; Bull. U. S. Geol. Surv. iii. pp. 121-142. The contents of a further collection made by A. S. Packard in 1875 are discussed at pp. 143-145, and the geographical distribution of the *Tineina* of Colorado is discussed, pp. 147-150.

Notes on *Tineina* bred in 1876; J. H. Threlfall, Ent. x. pp. 75, 76, 100, 163, & 164, and W. Machin, *op. cit.* pp. 49, 50, & 75.

On preserving specimens of *Tineina*; V. T. Chambers, Canad. Ent. ix. pp. 38-40.

Choreutis tjerkandrella, Thunb., pp. 315 & 316, figs. 3-6, and *pretiosana*, Dup., pp. 317 & 318, figs. 1 & 2; treated as distinct species, and transformations described and figured by P. Millière, Icon. iii. pl. cxl.

Psilothrix dardouinella, P. Millière. Transformations described and figured by him; Icon. iii. pp. 377 & 378, pl. cxlvii. figs. 13-15.

Melasina lugubris, Hübner. Transformations described and figured by P. Millière, Icon. iii. pp. 378-380, figs. 16-19. He also (*l. c.* pp. 381 & 382, fig. 20) notices and figures *M. ciliaris*, ? Ochs., pl. cxlvii.

Tinea nigricantella, P. Millière, redescribed and figured by him; Icon. iii. pp. 399 & 400, pl. cl. figs. 3 & 4. *T. auristrigella*, Chamb., = *Incurvaria mediotriatella*, Clem.; V. T. Chambers, Canad. Ent. ix. p. 207.

Adela biviella, Zell., and *bella*, Chamb., discussed; *id. l. c.* pp. 206 & 207. *A. schlägeri*, Zell., = *Dicte (Adela) corruscificiella*, Chamb.; *id. l. c.* p. 207.

Micropteryx. Unknown larva on birch in August; J. Lang, Ent. M. M. xiv. p. 140.

Acrolepia citri, Mill. & Rag. Transformations described and figured by P. Millière, Icon. iii. pp. 405-407, pl. cl. figs. 17-20.

Depressaria costosa, Haw. A peculiar form bred from *Genista tinctoria*; E. Meyrick, Ent. M. M. xiii. pp. 281 & 282.

Gelechia. An unknown larva, supposed to belong to this genus, noticed; Snellen van Vollenhoven, Tijdschr. Ent. xx. p. xv. *G. innotella*, *intactella*, *monospilella*, *flavidella*, *collitella*, *convulsella*, and *contextella*, Walk., belong to *Ecophora*; *G. subditella*, Walk., = *Endrosis fenestrella*; *Psecadia teras*, Feld., = *Ecoph. picarella*, Walk.: A. G. Butler, P. Z. S. 1877, p. 405. *G. ella*, Chamb., = *glandiferella*, Zell., p. 14; *G. quinella*, Zell., = *cercerisella*, Chamb., Texan var.; *G. leuconota*, Zell., perhaps = *Phatusa plutella*, Chamb., and *G. pudibundella*, Zell., perhaps = *rubensella*, Chamb., p. 23; *G. plutella*, Chamb., perhaps = *serrativitella*, Zell., p. 24; V. T. Chambers, *l. c.* *G. nigro-maculella*, P. Millière, redescribed and figured by him; Icon. iii. p. 318, pl. cxl. fig. 10. *G. albi-palpella* bred; W. Machin, Ent. x. p. 143.

Lita epithymella, Staud. Transformations figured and described by P. Millière, Icon. iii. pp. 392-394, pl. cxlix. figs. 8-10.

Nothris senticetella, Staud. Transformations figured and described; *id. l. c.* pp. 402 & 403, pl. cl. figs. 9-11. *N. limbipunctella*, Staud. ??, described from Bilbao; A. Rössler, S. E. Z. xxxviii. p. 378. *N. dolabella*, Zell., = *Hypsolophus eupatoriella*, Chamb.; V. T. Chambers, *l. c.* p. 23.

Perimede erransella, V. T. Chambers, noticed by him, *l. c.* p. 147.

Helice pallidochrella (also noticed at p. 15) and *Agnippe bicolorella*. The supposed larva of one of these species, probably the former, noticed; *id. l. c.* pp. 231 & 232.

Pitys fasciella, V. T. Chambers, redescribed by him, *l. c.* pp. 207 & 208.

Symmoca oxybiella, P. Millière, redescribed and figured by him; Icon. iii. pp. 304 & 305, pl. cxxxviii. figs. 1 & 2.

Anchinia grisescens, Frey, and *laureolella*, Herr. Schöff. Transformations described by J. v. Homay, Verh. z.-b. Wien, xxvii. SB. pp. 33 & 34.

Ecophora australisella, Chamb., probably = *Ec. determinatella*, Zell.; *Ec. constrictella*, Zell., may = *Theisoa bifasciella*, Chamb.: V. T. Chambers, *l. c.* pp. 24 & 25. *Ec. cryptogamorum*, P. Millière, redescribed and figured by him; Icon. iii. pp. 305 & 306, pl. cxxxviii. figs. 3 & 4.

Holocera, Clem. *Blastobasis sciophilella*, Zell., is allied to *H. triangularella*, Chamb.; both forms, as well as *B. nubilella*, Zell., are probably varieties of *H. glandulella*, Riley: V. T. Chambers, *l. c.* pp. 71 & 72.

Chauliodes daucellus, De Peyerimhoff, redescribed and figured by him in Millière's Icon. iii. pp. 227 & 228, pl. cxxv. figs. 1-4.

Butalis. A new British species, perhaps *dissimilella*, Herr. Schöff., noticed; E. Meyrick, *l. c.* xiv. p. 111. *B. asmodella*, P. Millière, noticed and figured by him; Icon. iii. pp. 398 & 399, pl. cl. fig. 2.

Pancalia latreillella, Steph., and *nodosella*, Mann, are sexes; P. C. T. Snellen, Tijdschr. Ent. xx. pp. 85-89.

Glyphipteryx montinella, V. T. Chambers. Characters discussed by him, *l. c.* p. 14.

Antispila ampelopsiella and *hydrangeawella*, V. T. Chambers, noticed, and the latter redescribed by him; *l. c.* pp. 195 & 196. *A. riviillii*, Staint.: O. Rondani figures and describes it in all stages (pp. 288 & 289, pl. ix. figs. 1-10), changing the name to *A. rivillella*, and adding descriptions of various parasites, Bull. Soc. Ent. Ital. ix. pp. 287-291, pl. ix.; note on the summer brood, H. T. Stainton, Ent. M. M. xiv. p. 6.

Argyresthia andereggiella. Larva noticed; J. B. Hodgkinson, Ent. x. pp. 100 & 101. *A. undulatella*, Chamb., = *austerella*, Zell.; V. T. Chambers, *l. c.* p. 72.

Gracilaria (Coriscium) quinquestrigella, pp. 14 & 15. *G. (Coriscium) albanotella* and *G. fasciella*, p. 123, *G. 12-lineella*, p. 124, and *G. plantaginiselletta*, p. 127; all of V. T. Chambers, discussed by him, and the last species renamed *erigeronella*. *G. fasciella* and *5-notella* are probably identical; *inornatella* = worn specimens of *puckardella* and *superbifrontella*; *G. purpuriella* may be the same as the European *G. stigmatella*, Fabr., pp. 194 & 195, *id. l. c.*

Coleophora bistrigella, Chamb. Amended description; *id. l. c.* pp. 72 & 73.

Batrachedra præangusta, Haw., *B. clemensella*, and *Asychna pulvella*, Chamb., and probably *B. striolata*, Zell., are referable to this species; *id. l. c.* pp. 145 & 146.

Laverna gleditschiella: larva and habits noticed; *id. l. c.* pp. 232-234. *L. griseella* and *murtfeldtella*, Chamb., are identical; *id. l. c.* p. 13. *L. ænothæella*, Chamb., = *Phyllocnistis magnatella*; *id. l. c.* pp. 73 & 74.

Opostega spatulella, Guén. Habits; W. D. Cansdale, Ent. M. M. xiv. pp. 139 & 140. Amended description; H. T. Stainton, *tom. cit.* p. 140.

Nepticula aeneo-fusciella, Herr. Schöff. A species supposed to be this (and if so, new to Britain), bred; J. B. Hodgkinson, Ent. x. pp. 134 & 135. *N. quinquella*; larva noticed; E. Meyrick, *l. c.* pp. 111 & 112.

Guenea, Mill. [Zool. Rec. xi. p. 438], recharacterized; P. Millière, Icon. iii. p. 436. *G. borreonella*, redescribed, *l. c.* pl. cliii. figs. 20 & 21, Alpes Maritimes.

New genera and species:—

Crinopteryx, De Peyerimhoff, Millière's Icon. iii. p. 229. Allied to *Incurvaria*; type, *C. familliella*, De Pey., *l. c.* pp. 229–233, pl. cxxv. figs. 5–12 (= *Coleophora cistorum*, De Pey., *olim.*).

Blepharocera, V. T. Chambers, Bull. U. S. Geol. Surv. iii. p. 144. Allied to *Dasycera*; type, *B. haydenella*, sp. n., *l. c.* p. 145, Colorado.

Lepidotarphius, W. B. Pryer, Cist. Ent. ii. p. 235. Allied to *Butalis*, *Pancalia*, and *Staintonia*; type, *L. splendens*, sp. n., *l. c.* pl. iv. fig. 13, Shanghai.

Simaethis pronubana, P. O. T. Snellen, Tijdschr. Ent. xx. p. 48, pl. iii. fig. 25, Java and Celebes.

Choreutis solaris, N. Erschoff, *l. c.* p. 342, Irkutsk.

Orosana atra, A. G. Butler, P. Z. S. 1877, p. 404, Canterbury, New Zealand.

Tinea maniella, A. Rössler, S. E. Z. xxxviii. p. 376, Bilbao and Florence; *T. palestrica*, A. G. Butler, *l. c.* p. 404, New Zealand.

Tineites crystalli, Kawall, a supposed *Tinea*-larva enclosed in rock-crystal from Siberia; A. Dohrn, S. E. Z. xxxviii. pp. 256 & 257.

Nemophora pseudopilella, De Peyerimhoff, Pet. Nouv. ii. p. 102, Hyères, Cannes; *N. dorsiguttella*, N. Erschoff, Hor. Ent. Ross. xii. p. 343, Irkutsk.

Adela infantella, id. *l. c.* p. 343, Irkutsk.

Anesychia discostrigella, V. T. Chambers, Bull. U. S. Geol. Surv. iii. p. 122, Colorado.

Cerostoma fulculella, N. Erschoff, *l. c.* p. 343, Irkutsk.

Psecadia nigripedella, id. *l. c.*, East Siberia; *P. vittalbella* (Zell., MS.), H. Christoph, Hor. Ent. Ross. xii. p. 292, pl. viii. fig. 65, Krasnovodsk.

Depressaria rubro-ciliella, E. L. Ragonot, Pull. Soc. Ent. Fr. (5) vii. p. cxxiv., Lardy; *D. multiplicella*, Ussuri, and *anticella*, Irkutsk; N. Erschoff, *l. c.* p. 344. *D. caucasica*, H. Christoph, *l. c.* p. 293, pl. viii. fig. 66, Kurusch.

Cryptophasa russata, A. G. Butler, *l. c.* p. 475, Cape York.

Cryptotechia, A. G. Butler (Cist. Ent. ii.) describes the following species from the Amazons:—*C. anceps*, *sericata*, *oblita*, p. 163, *fallax*, *stabilis*, and *tabida*, p. 164, *inflata*, *vaga*, and *tinctipennis*, p. 187, *capida*, *salutaris*, and *nitens*, p. 188, *annosa*, *evanescens*, and *curtipennis*, p. 189, *arinotata*, *marcida*, *strigivenata*, and *urbana*, p. 190, *alligans*, *peccans*, and *trailii*, p. 191, *virginalis*, *javarica*, *rosacea*, and *trilineata*, p. 192; *C. carnifex* and *rufosparsa*, id., P. Z. S. 1877, p. 406, New Zealand; *C. murcidella*, H. Christoph, *l. c.* p. 294, pl. viii. fig. 67, Derbent.

Gelechia serratipalpella and *pedmontella* [sic], p. 123, *glycy[r]hizella* and *amorphæella*, p. 124, *monumentella* and *trilineella*, p. 125, *G. ? ocellella*, *G. ? anarsiella*, and *G. ochreostrigella*, p. 126, *G. bicostomaculella* and *triocellella*, p. 127, *G. collinusella*, p. 128, and *G. packardella*, p. 143; V. T. Chambers, Bull. U. S. Geol. Surv. iii., all from Colorado. *G. cinctipunctella*, Amoor, p. 344, *G. (Lita) melanotephrella* and *G. (Telia) trijugella*, Irkutsk, and *G. (Anacampsis) lachtensis*, St. Petersburg, p. 345; N. Erschoff, l. c. *G. invenustella*, C. Berg, Lep. Patag. pp. 98 & 240, Patagonia. *G. melantypella*, Mann, Verh. z.-b. Wien, xxvii. p. 498, Landro. *G. oxycedrella*, P. Millière, Icon. iii. p. 177, pl. cxviii. figs. 1-6, South France. *G. superfetella*, De Peyerimhoff, Pet. Nouv. ii. p. 102, Alsace.

Telia tigrina, H. Christoph, l. c. p. 296, pl. viii. fig. 68, Krasnovodsk.

Lita valesiella, O. Staudinger, S. E. Z. xxxviii. p. 205, Valais and the Caucasus; *L. vasconiella*, A. Rössler, l. c. p. 377, Bilbao; *L. apificella*, Mann, l. c. p. 499, Styria.

Tachyptilia atychioides, A. G. Butler, P. Z. S. 1877, p. 405, pl. xliii. fig. 14, New Zealand.

Anarsia halimodendri, H. Christoph, l. c. p. 297, pl. viii. fig. 69, Krasnovodsk.

Anchinia dolomiella, Mann & Rogenhofer, Verh. z.-b. Wien, xxvii. (SB.) p. 32, Tirol.

Nothris ? bimaculella, V. T. Chambers, Bull. U. S. Geol. Surv. p. 122, Colorado; *N. bilbaonella*, A. Rössler, l. c. p. 378, Bilbao.

Æcophora ochricolor and *luticiliella*, N. Erschoff, l. c. p. 346, Tiflis; *Æ. sorrida*, *griseata*, and *parca*, A. G. Butler, l. c. p. 405, New Zealand.

Cydosia sylpharis, id. l. c. p. 87, Albemarle Island, Galapagos.

Eurynome albella, V. T. Chambers, l. c. p. 140, Colorado.

Butalis biventrella, A. Rössler, l. c. p. 380, Bilbao; *B. sagittatella*, N. Erschoff, l. c. p. 347, Albasin; *B. gurdella*, H. Christoph, l. c. p. 298, pl. viii. fig. 70, Derbent; *B. ossianella*, P. Millière, Icon. iii. p. 397, pl. cl. fig. 1, Alpes Maritimes.

Glyptiphyx magnatella, N. Erschoff, l. c. p. 346, Irkutsk.

Argyresthia montella, *quercicoella*, and *altissimella*, p. 130, and *pedmontella*, p. 131; V. T. Chambers, l. c., Colorado. *A. chrysidella*, De Peyerimhoff, Pet. Nouv. ii. p. 102, Alpes Maritimes. *A. reticulata*, O. Staudinger, l. c. p. 205, South Switzerland.

Gracilaria linearis, A. G. Butler, l. c. p. 406, pl. xliii. fig. 16, New Zealand; *G. (Coriscium) quinquenotella*, V. T. Chambers, Canad. Ent. ix. p. 124, Kentucky.

Coleophora basistrigella and *artemiscoella*, id. Bull. U. S. Geol. Surv. iii. p. 133, Colorado; *C. sarothamni*, A. Rössler, l. c. p. 77, Lorch; *C. lativittella*, N. Erschoff, l. c. p. 346, Irkutsk.

Staintonia ? fulgens, id. l. c. p. 347, Amoor.

Batrachedra clemensella, V. T. Chambers, l. c. p. 134, Colorado.

Laverna albidorsella, O. Staudinger, l. c. p. 206, Cannes and Sardinia; *L. ? coloradella*, V. T. Chambers, l. c. p. 136, Colorado.

Heliozela ? asella, id. Canad. Ent. ix. p. 108, Kentucky.

Lithocolletis amorphæella and *amphicarpeella*, id. Bull. U. S. Geol. Surv. iii. p. 137. (These and *L. texana*, Zell., may = *robinella*, Clem., varr.)

Bucculatrix albella (? = *immaculatella*, Chamb., var.), *id.* l. c. p. 141, Colorado.

Nepticula cistivora, De Peyerimhoff, P. Millière's Icon. iii. pp. 233-237, pl. cxxv. figs. 13-16.

PTEROPHORIDÆ.

Agdistis tamaricis, Zell. Transformations described and figured by P. Millière, Icon. iii. pp. 237-239, pl. cxxvi. figs. 5-7.

Pterophorus lithodactylus. Larva and pupa described; G. T. Porritt, Ent. M. M. xiii. p. 236.

Aciptilia alternaria, Zell., noticed; C. Berg, Bull. Mosc. lii. p. 21, and An. Soc. Argent. iv. p. 210.

Aciptilus patruelis, Feld., probably = *A. monospilalis*, Walk.; A. G. Butler, P. Z. S. 1877, p. 407.

Eldematophorus rogenhoferi, Mann. Transformations described by Mann & Rogenhofer, Verh. z.-b. Wien, xxvii. p. 500.

New species:—

Lioptilus cineraria, P. Millière, Icon. iii. p. 418, pl. clii. fig. 1, Isle Sainte Marguerite.

Platyptilia terminalis, N. Erschoff, Hor. Ent. Ross. xii. p. 347, Irkutsk.

Mimaseoptilus pinarodactylus, *id.* l. c. p. 348, Irkutsk.

DIPTERA.

BY

E. C. RYE, F.Z.S., M.E.S.

THE GENERAL SUBJECT.

KITTEL, G., & KRIECHBAUMER, J. . Systematische Uebersicht der Fliegen, welche in Bayern und in der nächsten Umgebung vorkommen. Abh. Ges. Nürnberg. v. p. 1 *et seq.*

Contains the *Stratio[to]myiidae*, *Xylophagidae*, *Cænomyiidae*, *Tabanidae*, *Bombyliidae*, *Acroceridae*, *Empidae*, *Asilidae*, *Scenopinidae*, *Therevidae*, *Leptidae*, *Dolichopodidae*, *Platypesidae*, *Lonchopteridae*, *Pipunculidae*, *Syrphidae*, *Conopidae*, and *Æstridae*, with localities and dates for some of the more important species.

OSTEN-SACKEN, C. R. Western Diptera: Descriptions of new genera and species of Diptera from the region west of the Mississippi and especially from California. Bull. U. S. Geol. Surv. iii. pp. 189-354.

The author is impressed with the unity of the Western fauna. The species taken by himself in California disclose unexpected analogies and coincidences between its fauna and the faunæ of Europe, Chili, and even Australia, and also some unforeseen differences from the fauna of the United States. Many new species are described, and others indicated, and the paper is full of very valuable and practical remarks on synonymy, structure, and geographical distribution. Some remarks on the latter (pp. 349-354) are more properly included in the General Subject of *Insecta* [antea, p. 7].

SCHNABL, J. Insectorum quæ Diptera appellantur ab Johanne Schnabl, Henrico Dziedzicki, Johanne Wankowicz, Ludovico Anders, diversis Poloniæ atque Minsciæ provinciæ locis collectorum, libellus, a Dr. Joh. Schnabl conscriptus. Varsaviæ: 1877, 4to, pp. 24.

Extracted from the Proceedings of the 5th Meeting of the Association of Russian Naturalists and Physicians, in Warsaw.

WULP, F. M. VAN DER. Diptera Neerlandica. De Tweevleugelige Insecten van Nederland. Eerste Deel. s'Gravenhage: 1877, large 8vo, pp. 498, pls. i.-xiv.

The commencement of a valuable work (written, unfortunately, entirely in Dutch), in which the Netherlands representatives of the Nematocerous (and the *Stratio[to]myiidae* and *Cænomyiidae* of the Brachycerous) *Orthorrhapha* are described, with notices of such allied genera and species as are likely to occur, or to be useful to the Dutch Dipterologist. Two new species are characterized. The plates, on which neuration, &c., is figured, with a type of each family, are of very great excellence.

K. Fritsch, Denk. Ak. Wien (Math. Nat. Cl.) xxxiv. p. 33 *et seq.*, gives tables of the times of appearance, &c., of 870 species of *Diptera* in Austro-Hungary, with other apparently useless fly-statistics.

North America. For list of fossil *Diptera* (including new genera and species) from Tertiary beds of the Lower White River in Utah and Colorado, and at Quesnel Mouth, British Columbia, see SCUDDER, *anted*, pp. 3 & 4.

List of Canadian *Diptera*; W. Couper, Canad. Ent. ix. pp. 133-135.

H. Loew, Z. ges. Naturw. xlviii. [1876], pp. 317-340, describes new species from North America.

G. Gerke, Verh. Ver. Hamb. iv. [pp. 6, pl.; sep. copy], describes the metamorphoses of the naked-winged species of *Ceratopogon*, of *Tanypus nigro-punctatus*, Staeg., and of *Hydrellia mutata*, Meig.

Terminology. J. M. F. Bigot, Bull. Soc. Ent. Fr. (5) vii. p. clxxxiii., apparently ignorant of the fact that entomological nomenclature is written in Latin, and that the Greek "ν" becomes "y" in that tongue, seriously proposes to write *Echinomuia*, *Anthomuia*, &c., for *Echinomyia*,

Anthomyia, &c., which (as he says) in deference to the purists, is the present indispensable orthography. He himself evidently prefers *Echinomia*, *Anthomia*, &c. As to *Echinomyia*, the original describer so corrected it. Would M. Bigot spell *Bombylius*, "*Bombulius*"? He asks why we do not write "mia," and enquires to what end is this multiplication of vowels: to which it may be replied that we should write "mia" if we wished to refer to the Greek feminine of "one," but "myia" if we wished to refer to "a fly." It may also be observed that Bigot (*tom. cit.*) describes new genera of flies with the termination "-mys," as if they were Rodents, following the mistake of *Stratiomys*, corrected thirty years ago by Agassiz to *Stratiomyia* [and which should, from the derivation given by Agassiz, be apparently still further corrected to *Stratiotomyia*].

CECIDOMYIIDÆ.

KARSCH, F. A. F. Revision der Gallmücken. Münster: 1877, 8vo, pp. 58, pl.

An academical dissertation, containing descriptions of two new genera and three new species, with detailed descriptions of *Cecidomyia hirticornis* (Stäg.), Zett., and *C. nigratarsis* (Stäg.), Zett., from Stäger's types preserved in the Berlin Museum. The principal aim of the paper seems to be to disturb the existing nomenclature of the family by a strict application of the rule of priority. Much, however, may be said against the author's assumptions.

F. Löw, Verh. z.-b. Wien, xxvii. pp. 1-38, pl. i., in a supplement to his former papers (*op. cit.* 1873-75), describes various new species (from living specimens) and their economy, and adds particulars to *Cecidomyia rosarum*, Hdy., *C. barbareæ*, Curt. (= *sisymbrii*, Schrank), *ulmarie* and *onobrychidis*, Br., *asperulæ*, Lw., *salicis*, Schr., *artemisiæ*, Bouché, *terminalis*, H. Lw., *carpini*, F. Lw., *Diplosis loti*, Deg., *Asphondylia coronillæ*, Vall., *A. pimpinellæ* and *thysselini*, H. Lw., *pericarpicola* and *dauci*, Br. (all four one species, renamed *umbellatarum*, p. 31), and *Hormomyia millefolii*, H. Lw. Various galls (without the insects), both new and already known, are also discussed and figured.

References to British gall-producers noticed since Müller's list in Ent. Ann. 1872; E. A. Fitch, Ent. x. p. 30.

Cecidomyia-galls observed on *Juniperus*, *Lupinus*, *Audibertia*, *Garrya*, *Artemisia*, and *Baccharis*, in California; C. R. Osten-Sacken, Bull. U. S. Geol. Surv. iii. p. 192.

Asphondylia. Observations on the species occurring near Glasgow, and their galls; F. G. Binnie, P. N. H. Soc. Glasg. iii. pp. 111-114.

Cecidomyia trifolii, F. Lw.; gall, &c., described, *id. l. c.* p. 114. *C. betulæ* and *pruni*, Kalt., *galii*, Winn., and *pustularis*, Bremi, and *Hormomyia millefolii*, Lw.; observations on galls, &c., and on galls of unknown species occurring in Scotland. *Id. l. c.* pp. 182-185.

Diplosis variegata, Macq., ♂, fig. 7, and wings, &c., of other *Cecidomyiidae* figured; F. N. v. d. Wulp, Dipt. Neerl. i. pl. ii.

Haplusia, g. n., Karsch *l. c.* p. 16, for *H. plumipes*, sp. n., *ibid.*, Brazil.

Villigera, g. n., *id. l. c.* p. 17, for *V. frauenfeldi*, sp. n., *ibid.*, Hong-Kong.

Dasyneura crista-galli, sp. n., *id. l. c.* p. 31, bred from gall on *Rhinanthus crista-galli*, near Berlin.

Cecidomyia pilosella (on *Hieracium pilosella*) and *quercus* (on *Quercus robur*), p. 179, *cerastii*, p. 181 (on *Cerastium viscosum*), Binnie, *l. c.*, Scotland; *C. alni*, p. 2 (on *Alnus glutinosa*), *genisticola*, p. 4 (on *Genista tinctoria*), *tortrix*, p. 6, and *sodalis*, p. 7 (on *Prunus spinosa*), *homocera*, p. 8 (on *Quercus cerris*), *orobi*, p. 10 (on *Orobis vernus*), *corrugans*, p. 11 (on *Heracleum sphondylium* and *Charophyllum aromaticum*), F. Löw, *l. c.*, Austria: spp. nn.

Diplosis phillyree, p. 13 (on *Phillyrea media*), *dryobia*, p. 14 (on *Quercus pedunculata* and *Q. sessiliflora*), *anthobia*, p. 16 (on *Cratægus oxyacantha*), *lonicerearum*, p. 17 (on *Viburnum*, *Lonicera*, and *Sambucus*, spp. nn., Löw, *l. c.*, Austria.

Epidosis nigripes, sp. n., *id. l. c.* p. 19 (on *Viburnum*, *Lonicera*, and *Sambucus*: connects *Dirrhiza* and *Epidosis* generically), Austria.

MYCETOPHILIDÆ.

Sciara rufiventris, Mcq., ♀, pl. iii. fig. 9, *Boletina basalis*, Meig., ♂, pl. iv. fig. 1, *Mycetophila signata*, Meig., ♀, pl. v. fig. 8, *Sciophila fuscata*, Winn., ♀, pl. v. fig. 15, and *Platyura humeralis*, Winn., ♂, pl. vi. fig. 15, figured, with neurulation and other details of many other species; F. M. v. d. Wulp, Dipt. Neerl. i. pls. iii.-vi.

Gnoriste megarrhina, sp. n., C. R. Osten-Sacken, Bull. U. S. Geol. Surv. iii. p. 193, Yosemite Valley.

Sciophila æstiva, sp. n., V. d. Wulp, *l. c.* p. 169, Holland.

RHYPHIDÆ.

Rhyphus fenestralis, Scop., ♀; V. d. Wulp, *l. c.* pl. xiii. fig. 15.

BIBIONIDÆ.

Bibio reticulatus, Lw., ♀, fig. 9, with neurulation, &c., of other genera; *id. l. c.* pl. vii.

SIMULIIDÆ.

Simulium maculatum, Meig., ♀, with wing; *id. l. c.* pl. vii. figs. 1 & 2.

CHIRONOMIDÆ.

Ceratopogon fasciatus, Meig., ♀, pl. viii. fig. 5, *Chironomus viridis*, Mcq., ♂, pl. viii. fig. 9, and details of neurulation, &c., in other genera, pls. viii. & ix.; *id. l. c.*

Chasmatonotus bimaculatus, sp. n., Osten-Sacken, *l. c.* p. 191, Catskill Mts., Quebec.

BLEPHAROCERIDÆ.

Blepharocera yosemite [-*tana*], sp. n., Osten-Sacken, *l. c.* p. 195, Yosemite Valley, California.

CULICIDÆ.

Culex annulatus, Schr., ♀, fig. 1, with details of neurulation, &c., in other genera; V. d. Wulp, *l. c.* pl. x.

Corethra plumicornis. J. Dogiel, Mém. Pétersb. (7) xxiv. No. 10, pp. 37, 2 pls., discusses the anatomy and physiology of the heart of its larva.

Aedes fuscus, sp. n., Osten-Sacken, *l. c.* p. 191, Massachusetts (metamorphosis observed).

PSYCHODIDÆ.

Pericoma ocellaris, Meig., ♀, fig. 15, with details of neurulation, &c., in other genera; V. d. Wulp, *l. c.* pl. ix.

Pericoma magnicornis, sp. n., *id.* *l. c.* p. 319, Holland.

TIPULIDÆ.

Cylindrotoma distinctissima, Meig., ♂, pl. xi. fig. 7, *Limnobia tripunctata*, F., ♂, pl. xii. fig. 7, *Trichosticha maculata*, Meig., ♂, *Gnophomyia pilipes*, F., ♂, with neurulation and details of other genera; V. d. Wulp, *l. c.* pls. x.-xiii.

Dimorphism in *Tipula præcisa*, Lw.; Osten-Sacken, *l. c.* p. 209.

Osten-Sacken, *l. c.*, discusses the following new genus and species:—

Phyllolabis, p. 202. *Limnophilina*, with four posterior cells; male genitals very large and club-shaped, like *Tipula*; marginal cross-vein absent. *P. claviger*, p. 203, *encausta*, p. 204, California.

Limnobia sciophila, p. 197, California.

Elliptera clausa, p. 198, California.

Erioptera dulcis, p. 198, *bipartita*, p. 199, California.

Limnophila damula, p. 201, California.

Trichocera trichoptera, p. 204, California.

Eriocera californica, p. 204, California, *brachycera* (= *E. spinosa*, O.-S., ♀), p. 205, White Mountains.

Pedicia obtusa, p. 205, California.

Ptychoptera lenis, p. 206, California and Colorado.

Protoplasta vipio, p. 208, San Francisco.

Tipula beatula, p. 209, *spernax*, p. 210, California.

Pachyrrhina altissima, p. 210, Rocky Mts., New Mexico.

STRATIO [TO] MYIIDÆ.

Beris vallata, Först., ♀, fig. 1, with neurulation, &c., of other genera; V. d. Wulp, Dipt. Neerl. i. pl. xiv.

Euceromys [*Euceratomyia*], g. n., J. M. F. Bigot, Bull. Soc. Ent. Fr. (5) vii. p. lxxiv. For *Odontomyia nexura* ?, Walker.

Calochætis [*Callich-*], g. n., for *C. bicolor* (name only), sp. n., Manilla, *id. ibid.*

Nigritomyia [vox hybr.], g. n., *id. ibid.*, for *Ephippium maculipenne*, Macq.

Oxycera crotchi, sp. n., Osten-Sacken, l. c. p. 212, California.

Clitellaria rustica, sp. n., *id. l. c.* p. 213, California.

XYLOPHAGIDÆ.

Macroceromys [*Macroceratomyia*], g. n., Bigot, l. c. p. lxxiii. No differential characters given. For *M. fulviventris*, sp. n., *ibid.* (name only), Mexico.

R[h]achicerus honestus, sp. n., Osten-Sacken, l. c. p. 211, California.

CENOMYIIDÆ.

Cenomyia ferruginea, Scop., ♀, and neuration; V. d. Wulp, Dipt. Neerl. i. pl. xiv. figs. 22 & 23.

TABANIDÆ.

239 specimens of one species of *Tabanus*, 28 *Stomoxys*, and a few other flies taken during a rapid walk of 1½ kilometres past an alkali meadow in Colorado much infested by those insects; S. Scudder, Psyche, ii. p. 89.

Silvius trifolium, O.-S., = *gigantulus*, Lw. (as *Chrysops*); Osten-Sacken, l. c. p. 215.

Pangonia hera, sp. n., *id. l. c.* p. 214, California.

Tabanus procyon and *sonomensis*, p. 216, *phænops*, p. 217, *insuetus* and *ægrotus*, p. 219, spp. nn., *id. l. c.*, California.

Chrysops noctifer, p. 220, *proclivis*, p. 222, *surdus*, p. 223, California, *fulvaster*, p. 221, Colorado and Utah, spp. nn., *id. l. c.*

LEPTIDÆ.

GOBERT, —. Revision des espèces françaises de la famille des Leptides. Amiens: 1877 (extr. from Mém. Soc. L. N. Fr.).

Symphoromyia. A Californian sp., ♀, stinging painfully, and drawing blood like a *Tabanus*; Osten-Sacken, l. c. p. 224.

THEREVIDÆ.

Thereva vialis, Osten-Sacken, l. c. p. 274, California; *T. (Tabuda)*, Wlk.) *melanophleba*, H. Loew, Z. ges. Naturw. xlviii. [1876] p. 317, San Francisco: spp. nn.

Psilbcephala levigata, p. 319, San Francisco, *platancala*, p. 321, Texas, spp. nn., Loew, l. c.

SCENOPINIDÆ.

Pseudatrichia, g. n., Osten-Sacken, *l. c.* p. 276, for *Atrichia*, Lw., 1866, nec Schrank, nec Gould (*Aves*, 1844).

Scenopinus bulbosus, sp. n., *id. l. c.* p. 275, Missouri.

ACROCERIDÆ.

Observation on species described by Philippi & Westwood, and on Schiner's divisions, &c.; J. W. Dunning, Ent. M. M. xiii. pp. 261 & 262.

Eulonchus sapphirinus, p. 276, *marginatus*, p. 277, spp. nn., Osten-Sacken, *l. c.*, California.

Pterodontia misella, sp. n., *id. l. c.* p. 277, Oregon.

Ocnæa helluo, sp. n., *id. l. c.* p. 278, Texas.

Opsebius diligens, *ibid.*, Vancouver Island, *paucus*, p. 279, California, *id. l. c.*, spp. nn.

Oncodes incultus, sp. n., *id. l. c.* p. 279, New Hampshire.

BOMBYLIIDÆ.

The references to *Systropus* in Zool. Rec. xiii. *Ins.* p. 197, were accidentally misplaced among the *Conopidæ*.

Bombylii in large numbers flying in company with *Anthophora* at Pompeii; E. Olivier, P. E. Soc. 1877, p. ii.

A revision of the genera in N. America north of Mexico, with observations on their salient representatives, affinities, distribution, &c., and the synonymy, &c., of their species. Remarkable epimeral hooks in most of the genera of *Anthracina* are mentioned. *Pæcilogathus*, Jaennicke, = *Phthiria*. *Argyramæba* bred from nest of ? *Pelopæus*, and other instances of parasitism on *Hymenoptera* noted. *Bombylius major* in California. *Tozophora* parasitic upon *Eumenes*; *T. fulva*, Gray, described (p. 267), Georgia. Osten-Sacken, *l. c.* p. 225 *et seq.*

The following new genera and species are characterized:—

Dipalta, p. 236. Differs from *Ecoprosopa* in its strongly contorted second vein, and in the third antennal joint having no terminal style, more like that of *Anthrax*. Also allied to *Diplocamptus*. For *Dipaltus serpentina*, p. 237, California, Colorado; also probably *Anthrax paradoxæ*, Jaenn.

Triodites, p. 245. Between the *Anthracina* and *Bombyliina*; eyes of ♂ contiguous on vertex, præfurca very short. *T. mus*, p. 246, Utah, California.

Anastæchus, p. 251. Closely allied to *Systæchus*, and = div. 1 of Löw of that genus; underside of head densely pilose, hiding the root of antennæ, epistoma, mouth, &c. *A. barbatus*, p. 252, Wyoming, California, Massachusetts.

Pantarbes, p. 254. Differs from *Bombylius* and allies in having three submarginal cells. Allied to *Mulio*. *P. capito*, p. 256, California.

Comastes, p. 256. Differs from *Bombylius* in its larger head, different shape and fur, &c. *C. robustus*, p. 257, Texas.

Paracosmus, p. 262, for *Allocotus*, Lw. (*nec* Mayr, *nec* Motsch.).

Epibates, p. 268. Allied to *Apatomyza*, but with last joint of palpi lanceolate; ♂ with minute rigid conical points on back of thorax. *E. funestus*, p. 271, White Mts., *luctifer*, *ibid.*, and *magnus*, p. 272, Vancouver Island, *muricatus* and *marginatus*, p. 272, California, *harrisi*, p. 273, P. N. U. States, and *Apatomyza nigra*, Macq.

Exoprosopa sima, Nevada, *dorcadion*, Colorado, California, Maine, &c. (? = the European *capucina*, F.), p. 231, *titubans*, p. 233, *dodrans*, p. 234, Colorado, *doris*, p. 235, Nevada, *eremita*, p. 236, California.

Anthrax alpha, p. 239, Wyoming.

Argyramæba fur, p. 244, Texas, bred from mud-wasp nest.

Bombylius metopium and *aurifer*, p. 249, *cachinnans*, p. 250, *lancifer*, p. 251, California.

Systæchus oreas, p. 254, California.

Lordotus (?) *planus*, p. 258, California.

Ploas fenestrata, p. 260, *rufula* and *amabilis*, p. 261, California.

Phthiria scolopax, p. 263, Colorado, *humilis*, p. 264, California.

Toxophora virgata, p. 266, Texas, Georgia.

NEMESTRINIDÆ.

Hirmonoura clausa, sp. n., Osten-Sacken, *l. c.* p. 225, Texas (the only Nemestrinid known in North America).

MIDASIDÆ.

[The reading *Midaidæ* cannot be supported: *Midas*, nom. propr., gives in Latin gen. *Midæ*. *Midasidæ*, though irregular, preserves identity.]

Rhaphiomidas, g. n., Osten-Sacken, *l. c.* p. 281. Closely allied to *Mitrodetus*, Gerst., but with different antennæ and two distinct ocelli.

R. episcopus, sp. n., p. 282, California.

Apiocera haruspex, sp. n., *id. l. c.* p. 283, California.

ASILIDÆ.

Ommatius annulatus, Mysol, *cnenideus*, New Guinea, spp. nn., J. M. F. Bigot, Bull. Soc. Ent. Fr. (5) vii. p. xli.

Osten-Sacken, *l. c.*, describes the following new species:—

Laphria (*Dasyllis*) *astur*, p. 285, *vultur* and *rapax*, p. 286, California.

Lampria felis, p. 286, California.

Ceraturgus lobicornis, p. 287, Idaho.

Dioctria pusio, p. 288, California.

Ablautatus minus, p. 290, S. California.

Ospricercus minos, p. 291, Colorado.

Clavator (not identical with *Hypenetes*) *sabulonum*, p. 292, California.

Pycnopogon cirrhatus [*cirra*-], p. 293, California.

Cyrtopogon cymbalista, California, *plausor*, New Mexico, Utah, &c., p. 297, *aurifex*, p. 301, *princeps* and *cretaceus*, p. 302, *evidens*, p. 306, *rejectus*, *nugator*, *positivus*, and *sudator*, p. 307, *rattus*, and *cerussatus*, p. 308, *nebulosus*, p. 309, California, *profusus*, p. 305, New Mexico.

Daulopogon arenicola, p. 310, California.

EMPIDÆ.

Hilara alpina, Lw., observed flying in numbers, near Berne, with a flake of silvery film attached to each individual; Osten-Sacken, Ent. M. M. xiv. p. 126.

Clinocera fuscipennis, p. 324, New Hampshire, *binotata*, p. 325, New York, spp. nn., H. Loew, Z. ges. Naturw. xlviii. [1876].

DOLICHOPODIDÆ.

Dolichopus unguatus, Linn., Meig., The yellow-legged *Musca unguata*, L. identified with *D. æneus*, Deg.; the black-legged *ungulata* with *Scellus notatus*, F. Observations on *D. longitarsis*, Stann., which stands. Loew, l. c. pp. 9-20.

Macharium maritimum, Hal. Description, observations on economy and metamorphoses; S. O. Suellon van Vollenhoven, Tijdschr. Ent. xx. pp. 56-63, pl. iv. figs. 1-5.

Medeterus, Fisch., recharacterized, and 27 species (8 new) recognized and fully described with synonymy, figures of detail, observation of doubtful species, and tables of ♂ and ♀ characters. F. Kowarz, Verh. z.-b. Wien, xxvii. pp. 39-76, pl. ii.

Polymedon, g. n., Osten-Sacken, Bull. U. S. Geol. Surv. iii. p. 317. Face prolonged downward and dependent, in the shape of a silvery ribbon; cilia of the tegula in the male unusually long. *P. flabellifer*, sp. n., *ibid.*, California.

Hygrocoeleuthus crenatus, p. 312, *afflictus*, p. 313, spp. nn., *id. l. c.*, California.

Dolichopus corax and *pollex*, spp. nn., *id. l. c.* p. 314, California.

Tachytrechus sanus, sp. n., *id. l. c.* p. 316, California.

Liancalus querulus, sp. n., *id. l. c.* p. 318, California.

Scellus vigil, p. 318, California, *monstrosus*, p. 319, British Columbia, spp. nn., *id. l. c.*

Medeterus seniculus, p. 46, S.W. Poland, *dichætus*, p. 49, Galizia, Breslau, Munich, *glaucellus*, p. 51, Görz, Carinthia, &c., *obesus*, p. 56, Bozen, *dichrocerus*, p. 59, figs. 12 & 13, Asch, *pinicola*, p. 61, Austria, Bavaria, &c., *dendrobæus*, p. 70, Austria and Germany, *petrophilus*, p. 71, fig. 18, Carinthia, Italy, spp. nn., Kowarz, l. c.

PHORIDÆ.

Platyphora, g. n., G. H. Verrall, J. L. S. xiii. p. 259. Of flat and broad shape, resembling small *Sphaerocera*: with no strong bristles on

frons, thorax, or legs. *P. lubbocki*, sp. n., p. 260, parasitic on ants (no species or locality mentioned).

Phora formicarum, sp. n., *id.* l. c. p. 258, parasitic upon *Lasius niger*.

SYRPHIDÆ.

Osten-Sacken, Bull. U. S. Geol. Surv. iii., describes the following new genus and species :—

Eupeodes, p. 328. Very like *Syrphus*, but with very largely developed 6th abdominal segment and hypopygium in ♂; scutellum unusually raised. *E. volucris*, p. 329, California, Nevada, Utah, Colorado.

Melanostoma tigrina [-num], p. 323, California.

Syrphus intrudens, p. 326, *opinator*, p. 327, *protritus*, p. 328, California.

Sphærophoria micrura, p. 330, California.

Allograpta fracta, p. 331, California.

Baccha lemur, p. 331, California, Wyoming, New Mexico, *angusta*, p. 332, California.

Volucella avida, California, and *satur*, Colorado, Utah, p. 333.

Temnocera setigera, p. 334, New Mexico.

Eristalis stipator, p. 336, Colorado, California, &c.

Pocota (not *Plocota*, as Schiner spells it) *alopez*, p. 338, *cyanella*, p. 339, California.

Chrysochlamys dives, p. 340, Kentucky, *nigripes*, Massachusetts, and *craesus*, Utah, p. 341.

Sphecomyia brevicornis, p. 341, California.

Orthoneura nigro-vittata, sp. n., H. Loew, Z. ges. Naturw. xlviii. [1876] p. 323, San Francisco.

MUSCIDÆ.

Tachina parasitic upon the abdomen of *Diapheromera femorata* and *Bacillus rossii* (*Orthoptera*); C. R. Osten-Sacken, Psyche, ii. p. 23.

Lucilia bufonivora, Moniez [Zool. Rec. xiii. Ins. p. 198]. Reference to Verh. z.-b. Wien, 1865, p. 241, where is a note by Boie on larvæ of a Dipteron attacking the soft parts of the mouths of toads in Bohemia; M. Girard, Bull. Soc. Ent. Fr. (5) vii. p. xxvii. See also pp. xciii.-xcv., for further instances of Batrachians attacked in a similar manner, and for a reference to *Batrachomyia*, MacL.; and p. clxxii. for opinion by Collin de Plancy and E. Taton, that the flies attack only sores already existing. Cf. also De Plancy, Bull. S. Z. Fr. ii. pp. 249-257, and Taton, *tom. cit.* pp. 259-268.

J. M. F. Bigot, Ann. Soc. Ent. Fr. (5) vii. p. 243, though rejecting *Calliphora*, *Melinda*, *Mufetia*, *Lucilia*, and *Chrysomyia* (*Myiochrysa*, Rond., wrongly written *Microchrysa*), Rob. Desv., adopts several anonymous subdivisions of *Somomyia*, Rond. [which he somewhat more correctly gives as *Somomyia*, l. c. p. 35 *et seq.*; it should however be written *Somatomyia*], corresponding as much as possible with these deposed genera. *Ochromyia fasciata*, *senegalensis*, and *lateralis*, Mcq., *exx. typ.*,

are referred to *Phumosia*, Desv.; as also are *Bengalia depressa* and *Polenia eristaloides*, Walk., *Somatomyia subtranslucida*, Berthol., *S. rubiginosa*, Big., and *O. incisuralis*, Mcq., to *Somatomyia*, Rond.; *O. nudistylum*, Mcq., does not belong to the *Muscidae*; *Curtonevra* [*Cyrtoneura*] *analitis*, Mcq., is a *Graphomyia*, and *C. cyanea*, M., a *Dasyphora*; *Sarconesia*, Bigot, = *Cynomyia*, Desv., and should be placed near *Calliphora*; a scheme almost identical with that of Rondani is given for the *Muscides* and allied *Calypteræ*: id. l. c. pp. 260-262.

Anthomyia radicum, L., var. n. *calopteni*, parasitic upon the egg of the "Rocky Mountain locust"; C. V. Riley, Rep. Ins. Mo. ix. pp. 92-95, fig. 23.

Anthomyia sp. from *Spiraea ulmaria*, and *A. sp.* from *Gentiana pneumonanthe*, p. 383; *Stegana hypoleuca* in oak and poplar, p. 385; *Leptomomyza gracilis* from tips of *Juncus obtusiflorus*, another reed, and *Leersia oryzoides*, p. 385; *Chlorops limbata* from tips of *Calamagrostis arundinacea*; *Phytomyza notata* and *P. pallida* from leaves of *Ranunculus*, and *P. flavipes* from leaves of *Erysimum præcox*; *Agromyza pallitarsis* from leaves of *Dactylis glomerata*; and *Hydrotia ciliata* from garden mould, p. 386; *Tephritis oxyacanthæ*, Perr., = *Trypeta antica*, Wied.; *Sphecolyma flava*, Perr., = *Anthomyia inanis*, Fall., but *Acanthiptera*, Rond., is retained for it generically, p. 379: É. Perris, Ann. Soc. Ent. Fr. (5) vii.

Sepedon sphegeus and *S. spinipes*. G. Geroke, Verh. Ver. Hamb. iii. [for 1876, published in 1878], pp. 145-149, pl. iii., discusses the metamorphoses of these species, with very rough figures in detail, &c.

Drosophila cellaris eating pickles; P. E. Soc. 1877, p. xv.

New genus and species:—

Carlottemyia, Bigot, tom. cit. p. xxvi. Referred to the *Ortalides*, *Tanypezides*, or *Trypetides*: no differential characters given. For *C. muerens*, id. l. c. p. xxvii., Mexico: = *Diacrita costalis*, Gerst., id. l. c. p. cxxxii.

Dejeania vexatrix, Osten-Sacken, Bull. U. S. Geol. Surv. iii. p. 343, Colorado.

Som[at]omyia tæniata, p. 36, Senegal, *boersiana* and *caffra*, p. 37, anchorata, p. 48, Natal, *esmeralda* and *nubiana*, p. 38, Khartum, *barbata*, p. 39, India, *pagodina*, Pondicherry, and *fusco-cincta*, Assam, p. 40, *rubiginosa* and *birmanensis*, p. 41, *infumata*, p. 42, Burma, *versicolor*, p. 42, and *obesa*, p. 43, Ceylon, *cæruleo-cincta*, p. 43, Pulo Penang, *tagaliana*, p. 44, Philippine Isles, *pictifacies*, Java, and *sylphida*, New Orleans, p. 45, *semiviolacea*, Porto Rico, and *montevideensis*, Monte Video, p. 46, *soulouquina*, p. 47, Hayti, *S. (Calliphora) nitens*, p. 244, Colombia, *S. (C.) castanipes*, p. 245, Quito, and *callogaster* [*callig.*], p. 246, La Plata, *S. (Lucilia) nigrina*, p. 247, Illinois, *pallidibasis*, ibid., *mutabilis*, p. 248, *flavigena* and *callipes* [vox hybr.], p. 249, *pueblensis*, p. 250, *fulvinota* and *argentifera*, p. 251, Mexico, *orenoquina*, Brazil [? Venezuela, if the specific name be from the Orinoco], and *gratiosa* (P = *mutabilis*, Big., var.; P P = *argentina*, Big., ♂ [!]), Buenos Aires, p. 253, *argentina*, Buenos Aires, and *japonica*, Japan, p. 254, *S. (L.?) jeddensis*, p. 255, Japan, *S. (Chrysomyia)*

aztequina, p. 252, Mexico, *amazona*, p. 255, Brazil, *punctifera*, p. 256, Natal, *pfefferi* [*pfeifferi*], Bourbon, and *saffrana*, Australia, p. 257, *pallifrons* and *melanifera*, p. 258, Australia. Bigot, Ann. Soc. Ent. Fr. (5) vii.

Azelia monodactyla, H. Loew, in "Entomologische Miscellen," published by the Silesian Ent. Soc. at Breslau, 1874; omitted from the notice of the paper in which it is described in Zool. Rec. xii. p. 476 [communicated by Baron Osten-Sacken].

Cordylura variabilis, H. Loew, Z. ges. Naturw. xlviii. [1876], p. 326, Massachusetts.

Lobioptera arcuata, id. l. c. p. 339, Long Island.

Pyrgota debilis, Osten-Sacken, Bull. U. S. Geol. Surv. iii. p. 343, Kentucky; *P. filiola*, Loew, l. c. p. 332, Texas.

Tetropismenus (differentiated from *Cormocaris*, Lw.) *hirtus*, Loew, l. c. p. 333, San Francisco.

Anacampta pyrrhocephala, id. l. c. p. 335, California.

Euxesta scoriacea, id. l. c. p. 336, Texas.

Ulidia (?) *rubida*, id. l. c. p. 337, California.

Trypeta (*Edicarena*) *persuasa*, p. 344, Denver, *T. (Acidia) fausta*, Mt. Washington, and *T. (Edaspis) penelope*, New York, p. 346, *T. (Eutreta) diana*, p. 347, Missouri (from gall on *Artemisia tridentata*), and *T. (Zonosema) basiolum*, p. 348, Massachusetts, Osten-Sacken, l. c.

Gaurax signatus, Loew, l. c. p. 338, Texas.

Sciomyza longipes, p. 328, New Hampshire, *humilis*, p. 330, Texas, *apicata*, p. 331, Hudson's Bay Territory, id. l. c.

Blepharoptera defessa, Osten-Sacken, l. c. p. 168, note, fig. 10, Hundred Dome Cave, Kentucky.

CESTRIDÆ.

Demonstration of locomotion in the larvæ of the Cestridæ; C. H. Allen, P. Am. Ass. xxiv. (Detroit: 1875), 1876, p. 230. An account of the movements of a larva, referred to *Hypoderma*, under the skin of a human patient.

Gasterophilus larvæ discharged by a woman suffering from stomach-catarrah, and also found in the liver of a parrot; Schoch, MT. schw. ent. Ges. v. p. 275.

Microcephalus, g. n., J. Schnabl, Insectorum, &c. (*antea* Titles), p. 23, and Deutsche E. Z. 1877, p. 49. Facies of *Arctophila*; wings like those of *Hypoderma*. Apparently only the male known. *M. lewii*, sp. n., l. c. and Deutsche E. Z. 1877, p. 52, pl. i. No. 1, Yenisseisk.

HIPPOBOSCIDÆ.

Lipoptena cervi. Transformations and economy quoted from Hartmann's observations; the female casts her wings in death; J. P. E. F. Stein, Deutsche E. Z. 1877, pp. 297 & 298.

(APHANIPTERA.)

PULICIDÆ.

W. H. Dall, *Am. Nat.* xi. pp. 7-11, describes the method by which fleas are trained for public exhibition, all performances simply consisting of efforts to escape.

Fleas surviving (with vitality enough to jump), after being kneaded in flour and baked in a loaf; *Sci. Goss.* xiii. p. 191.

Pulex penetrans. A plate illustrating the transformations of the "jigger," with explanatory letterpress; *Am. Nat.* xi. p. 756.

NEUROPTERA.

BY

ROBERT McLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

MEYER-DÜR, L. R. Berichtigungen und Ergänzungen zu meiner "Neuroptern-Fauna der Schweiz." *MT. schw. ent. Ges.* v. pp. 9-13.

Concerns the *Trichoptera* of the Swiss Fauna; the corrections and additions are noticed according to the Recorder's Revision and Synopsis of the European *Trichoptera*.

PROVANCHER, L. Faune Canadienne (Petite Faune entomologique du Canada). *Les Névoptères.* *Nat. Canad.* ix. pp. 38-43, 84-90, 118-123, 173-176, 201-205, 209-217, 241-244, 257-269.

Comprise the remaining *Pseudo-Neuroptera*, and all the *Planipennia* and *Trichoptera*, thus finishing the series [*cf. Zool. Rec.* xiii. *Ins.* p. 200]. These articles are reprinted in a separate form in the same author's "Faune Entomologique du Canada," ii. fasc. i. pp. 57-157; with additions and corrections (and also interleaved supplementary corrections).

PALMÉN, J. A. Zur Morphologie des Tracheensystems. *Helsingfors:* 1877, 8vo, pp. 1-149, 2 pls. [*antea*, p. 2].

The author enters at length into the relationship between the branchial plates or filaments by which respiration is effected in the aquatic larvæ

and pupæ of many insects, and the stigmata of the imago, in order to show that no genetic connection exists in the two systems. His conclusions are mainly drawn from examinations of many Neuropterous insects, such as *Ephemeridæ*, *Perlidæ*, *Trichoptera*, and *Sialis*. He supplements the observations of Newport, Gerstäcker, and others, on the existence of branchiæ in the perfect insect, and in an extended manner, proving that branchiæ in a more or less complete state of persistence are found in the imago of many species where such a condition had not been suspected, side by side with the ordinary stigmata, but not connected therewith. On the whole, however, he does not consider these branchiæ serve any functional purpose in the perfect insect.

Goldenberg, "Fauna Sarapontana Fossilis," Heft ii., enters at length into an examination of the fossil insects of the Carboniferous of Saarbrück, in which *Pseudo-Neuroptera* and *Orthoptera* take the most prominent position. With the former, it is here thought best to include those critical extinct forms for which the author erected the order *Palæodictyoptera*. The following are given as new:—*Dictyonæura elegans*, p. 9, pl. i. fig. 1, *elongata*, p. 10, pl. i. fig. 2, *schmitzii*, p. 11, pl. i. fig. 3, *obsoleta*, ibid. pl. i. fig. 4; *Termes laxa*, p. 17, pl. i. fig. 5; *Termitidium* (g.n.) *amissum*, p. 17, pl. i. fig. 6, *T. (?) rugosum*, ibid., pl. i. fig. 14.

Species of all families collected during two excursions in Belgium, firstly to Calmphout, secondly to the Hautes Fagnes, are noticed by De Selys-Longchamps & McLachlan in CR. Ent. Belg. xx. pp. xxxi. & xxxii., xxxix., & lx.

A List of a few species found in *Podolia* is given by M. Lomnicki in Sprawozd. Kom. fizyogr. xi. pp. 146–148.

P. R. Uhler gives a list of species in all families captured by him during the explorations of the U. S. Geol. Survey in 1875. Bull. U. S. Geol. Surv. iii. pp. 788–791.

TRICHOPTERA.

McLACHLAN, R. A Monographic Revision and Synopsis of the *Trichoptera* of the European Fauna. Part vi. pp. 281–348, pls. xxxii.–xxxvii. (May, 1877). London and Berlin, 8vo.

Entirely occupied by the *Leptoceridæ*, of which 52 species are described. As in former notices of this work, no analysis will be here given of the numerous changes in nomenclature, synonymy, &c., and only the new species will be recorded.

Phryganea operta. A fossil from the Tertiaries of Colorado is thus named by Scudder; Bull. U. S. Geol. Surv. iii. p. 762. Its affinities appear to be doubtful.

Limnophilidæ.

Limnophilus submaculatus, Rbr., occurs on the Hautes Fagnes, Belgium (on the Prussian frontier). De Selys-Longchamps & McLachlan, CR. Ent. Belg. xx. p. xl.

Sericostomatidae.

Helicopsyche. Von Siebold's notes on the occurrence of these cases in Switzerland (cf. Zool. Rec. xiii. *Ins.* p. 202) are reprinted in S. E. Z. xxxviii. pp. 246-249, with supplementary notes, and the author (pp. 251 & 252) adds extracts from a letter from Fritz Müller respecting the finding by him of cases in Brazil, with indications of a probable plan for breeding the insects.

Sphinctogaster, g. n., Provancher, Nat. Canad. ix. p. 261. Allied to *Mormonia*. Abdomen suddenly dilated at the extremity. Type, *S. lutescens*, sp. n., p. 262, Canada.

Leptoceridae.

Additions to the British Fauna. McLachlan, Ent. M. M. xiv. p. 18; Fletcher, l. c. pp. 70 & 117.

McLachlan (Revision and Synopsis) divides the European species of the family into four sections, viz., I. for *Molanna* and *Molannodes*; II. for *Odontocerum*; III. the typical section, including *Leptocerus*, *Mystacides*, *Setodes*, &c.; IV. represented in Europe by the single genus *Calamoceras*. Almost without exception, details are figured for each species.

New genera :—

Homilia, McLachlan, l. c. p. 317. Allied to *Leptocerus*, but the neururation alike in the sexes; spurs 1.2.2: type, *Mystacides leucophava*, Rambur.

Erotesis, p. 325. Agreeing with *Tricenodes* in wanting the apical fork No. 5 in the posterior wing, but the cellula thyridii is present in the anterior, which are short and rather broad; anal parts of ♂ very prominent. *E. baltica*, sp. n., p. 326, Island of Oesel and Finland (also England; cf. Ent. M. M. xiv. p. 162).

Adicella, p. 326. Agrees with *Erotesis* in neururation, but with the wings long and narrow, densely pubescent, and with long fringes; anal parts of ♂ not prominent. Types, *Setodes reducta*, McLach., and *filicornis*, Pict.

Æcetis, p. 329, formed to receive those species hitherto grouped in *Setodes*, in which the superior branch of the upper cubitus in the anterior wings is simple.

New species :—

Molanna carbonaria and *palpata*, id. l. c. p. 287, Finland.

Leptocerus commutatus (Rostock), p. 308, England, Saxony, Finland, &c.

Tricenodes unanimis, p. 324, Finland and Island of Oesel.

Æcetis intima, p. 331, Turcomania.

Calamoceras volzemi, p. 347, Portugal.

Setodes argentipunctella, id. Ent. M. M. xiv. p. 105, England and Ireland.

Heteroplectron borealis [sic], Provancher, Nat. Canad. ix. p. 263, Canada.

Rhyacophilidae.

Rhyacophila soror, sp. n. (Hagen), Provancher, Faune entomologique du Canada, ii. fasc. i., interleaved, p. 142 (3), Canada.

NEUROPTERA-PLANIPENNIA.

Panorpidae.

Notiothauma, g. n., R. McLachlan, Tr. E. Soc. 1877, p. 427. A very remarkable form, nearest to *Merope* among known genera, having oval or conical hairy joints to the antennæ; broadly oblong wings (overlapping horizontally in repose), with dense reticulation and very broad costal area, the basal veins and mesonotum furnished with erect spines. Type, *N. reedi*, sp. n., p. 429, pl. x. div. A, Chili.

Sialidæ.

MOODY, H. L. The larva of *Chauliodes*. Psyche, ii. pp. 52 & 53.

Concerns the habits and transformations of *C. pectinicornis*. [The Recorder would remark that this and some other references to the journal in which the above-noticed paper was published, strictly belong to 1878. The cover of the number in question bears the date "July and August, 1877"; the article just noticed has a reference to an event occurring on the 21st Oct., 1877, and the separate advertisement pages (only) indicate that the part was issued on the 12th Jan., 1878. From the same source we learn that the part for Nov. and Dec., 1877, was not issued until the 12th April, 1878.]

Corydalis cornutus, L. Riley, Rep. Ins. Mo. ix. pp. 125-129, supplements and corrects the account of its transformations given in his fifth report [cf. Zool. Rec. x. p. 431], more especially regarding the eggs. He points out that those referred by Walsh to this insect in all probability belong to a water-bug of the genus *Belostoma*, the true eggs and the manner in which they are deposited being quite different. He figures the egg-masses and a newly-hatched larva.

Nemopteridæ.

Himantopterus fuscinervis, Wesmael, should be transferred to the *Lepidoptera* in the vicinity of *Thymara*; McLachlan, CR. Ent. Belg. xx. pp. lvi. & lvii., and Westwood, Tr. E. Soc. 1877, pp. 437-439, pl. x. div. D.

Myrmeleonidæ.

Schenck, Ent. Nachr. iii. p. 93, gives a list of four species found in the Grand Duchy of Nassau and the adjoining districts, with notes. One of them is indicated as undescribed, and the peculiarities of its larva are given.

Mantispidæ.

Symphrasis, g. n., Hagen, S. E. Z. xxxviii. p. 208. Prosternum not divided (as in *Mantispa*); female with a long ovipositor. Types, *S. signata*, sp. n., *ibid.*, Fort Tejon, S. California, and *Mantispa myrapetrella*, Westw.

Mantispa burquei, Provancher, = *M. brunnea*, Say; Provancher, Nat. Canad. ix. p. 174.

Nymphidæ.

Myiodactylus nebulosus, sp. n., McLachlan, Ent. M. M. xiv. p. 85, New Guinea.

Hemerobiidæ.

Bothriomicromus, g. n. Allied to *Micromus*, but with the sectors of *Drepanopteryx*; the wing is not falcate. Scudder, Geol. Surv. Canada for 1876-77, p. 462. Type, *B. lachlani*, id. l. c., fossil in tertiary beds at Quesnel.

PSEUDO-NEUROPTERA.

THYSANURA.

EDMUNDS, JAMES. On the resolution of *Podura*-scale by means of a new paraboloid illuminator. M. Micr. J. xviii. pp. 85 & 86.

Of interest chiefly to microscopists, but containing interesting observations on the structure of this favourite "test-object."

ANDREW MURRAY, in his "Economic Entomology, *Aptera*" [antea, p. 1], pp. 401-416, gives an outline sketch of the group, prefaced by remarks on its systematic position, and the habits; he considers that great mischief is done to horticulturists by these creatures. Lubbock's monograph is followed for classification, and is largely made use of both in text and woodcuts; the latter illustrate the genera *Smynturus*, *Papirius*, *Orchesella*, *Tomocerus*, *Lepidocyrtus*, *Deegeria*, *Achorutes*, *Podura*, *Anura*, *Lepisma*, and *Machilis*.

Isotoma besselsi, sp. n., A. S. Packard, jun., Am. Nat. xi. p. 52, note, Polaris Bay (Hall's American Arctic Expedition).

MALLOPHAGA.

Nirmus asymmetricus, Nitzsch, redescribed and refigured from examples found on *Dromæus novæ-hollandiæ* in the Zoological Gardens at Rotterdam; E. Piaget, Tijdschr. Ent. xx. pp. 80-84, pl. vi.

Murray, l. c. pp. 376-387, gives an outline sketch of the genera of this group, which he classes with the *Anoplura*, for the sake of convenience. Many of the most striking or familiar forms are noticed, and there are good illustrative woodcuts, mostly copied (and reduced) from Nitzsch's figures. The genera *Menopon*, *Trinotum*, *Docophorus*, *Nirmus*, *Goniocetes*, *Goniodes*, *Lipeurus*, *Ornithobius*, and *Trichodectes*, are thus illustrated.

Nirmus taurus, sp. n., C. Giebel, Z. ges. Naturw. xlvii. [1876], p. 247, on *Buceros leucopygus*, W. Africa.

Docophorus pachynemus, p. 248, on *Buceros leucopygus*, and *D. horridus*, p. 249, on *Ciconia australis*, spp. nn., id. l. c.

Menopon albipes, sp. n., id. l. c. p. 250, on *Lobiovanelus albiceps*.

TERMITIDÆ.

Observations on species found in California by C. R. Osten-Sacken & H. A. Hagen; P. Bost Soc. xix. pp. 72 & 73. Refer principally to

Termopsis angusticollis; imagos with only wing-stumps were found in February, hence it is supposed that these had hibernated in that condition. A small species, apparently *Termes flavipes*, was observed at Sonoma in the same state; that species had not hitherto been found west of the Rocky Mountains. H. S. Treherne gives notes on another species (perhaps *Termopsis occidentalis*), as observed in Manitoba; *l. c.* p. 74.

For an enumeration of fossil species from the Carboniferous of Saarbrück, see *antèd.*, p. 199.

Termes flavipes. On its intestinal parasites (3 new Infusorians, and 2 vegetable); J. Leidy, P. Ac. Philad. 1877, p. 146.

EMBIIDÆ.

McLACHLAN, R. On the nymph-stage of the *Embiidæ*, with notes on the habits of the family, &c. J. L. S. xiii. pp. 373-384, pl. xxi.

Commences with notes on the discovery of all the stages of a species of *Oligotoma* in an orchid-house near London [*cf.* Zool. Rec. xiii. *Ins.* p. 204]; then follows considerations on the habits (which are probably phytophagous), systematic position, structure, distribution, &c. *Termes* and *Embia* have less in common than has been hitherto supposed, and the latter is probably more allied to the *Perlidæ*. The family is considered to be divisible into two genera only, viz., *Embia* and *Oligotoma*, *Olyntha* not being sufficiently distinct from the former.

Bolivar, commenting upon Girard's opinion that only one species exists in Europe, and that probably an importation, notes that a species is abundant in the larval form near Madrid, and is, no doubt, indigenous; Pet. Nouv. ii. p. 182. Girard replies, and thinks the discovery not opposed to his hypothesis; *l. c.* p. 185.

New species :—

Embia batesi, McLachlan, *l. c.* p. 380, Brazil, *salvini*, *ibid.*, Central America, *persica*, p. 382, N. Persia.

Oligotoma michaeli, p. 383, pl. xxi. (larva, nymph, and imago), on an orchid imported from India.

PSOCIDÆ.

Cæcilius hirtellus, sp. n., McLachlan, CR. Ent. Belg. xx. p. liv., Belgium (? introduced).

Atropos. A discussion on the structure of the head of this genus, more especially relating to the maxillæ and eyes; S. H. Scudder, Psyche, ii. pp. 49-51, and E. Burgess, *l. c.* pp. 87-89.

PERLIDÆ.

HAGEN, H. A. Beiträge zur Kenntniss von *Pteronarcys*. S. E. Z. xxxviii. pp. 477-492:

A valuable contribution to the natural history, anatomy, and physi-

ology of this remarkable genus, after a careful study of living and fresh specimens of *P. regalis*. The author remarks that *Kollaris insignis*, Pict., and *P. frigida*, Gerst., are only synonyms of *P. regalis*. The results of careful observations of the procreative act are fully detailed. He found that copulation took place many times between the same pair, and even after the female had commenced depositing eggs. The male organ is separated from the seminal vessels, and has no canal through it, but only a slit on the lower edge, into which the fecundating fluid is forced. Newport's account of the external branchiæ in the imago is in the main confirmed.

Perla selysi, Pict., rediscovered in Belgium; McLachlan, CR. Ent. Belg. xx. p. lv.

Perla chicoutimensis, sp. n., Provancher, Faune Entomologique du Canada, ii. fasc. i. 75, Canada (stated on the interleaved p. 72 (3) to be probably a variety of *Teniopteryx maura*, Burm.).

Leuctra tenella and *brunnea*, spp. nn., *id.* interleaved p. 80 (2), Canada (= *tenuis*, Pict., and *ferruginea*, Walk., of the author's "Petite Faune").

EPHEMERIDÆ.

McLACHLAN, R. Note sur l'insecte fossile décrite par M. P. de Borre sous le nom de *Breyeria borinensis*. C. R. Ent. Belg. xx. pp. xxxvi. & xxxvii.

The writer gives it as his opinion, after a personal examination of this fossil, that it should be referred to the *Ephemeridæ*, and not to the *Lepidoptera*.

WESTWOOD, J. O. Notes on the genus *Prosopistoma* of Latreille. Tr. E. Soc. 1877, pp. 189-194, pls. iv. & v.

An historical summary of what has been written on this anomalous genus, having especial reference to *P. variegatum*, with a critical examination of the papers published by MM. Joly on *P. punctifrons*. The author thinks direct observation of the transformations necessary before the genus can be finally located in this family. On the plates are original figures of *P. variegatus*, and copies of those given by the Jolys of *P. punctifrons*.

Cloe quebecensis, Provancher [*cf.* Zool. Rec. xiii. *Ins.* p. 206], is a *Siph-lurus*; *id.*, Faune Entomologique du Canada, ii. fasc. i. interleaved p. 82 (3).

Cloe rubescens, sp. n., *id.* interleaved p. 82 (3 bis), = *unicolor* of the author's Petite Faune, *nec* Hagen.

ODONATA.

BELLESME, JOUSSET DE. Phénomènes qui accompagnent la métamorphose chez la Libellule déprimée. C. R. lxxxv. pp. 448-450. [Abstracted in Ann. N. H. (4) xx. p. 447; and in Pop. Sc. Rev. (n.s.) i. p. 437.]

The author concludes his observations by asserting that it is by swal-

lowing air, and storing it in the digestive canal, that this insect acquires sufficient force to accomplish the greater portion of its transformation, and he is inclined to think that the same thing happens almost generally in insects.

BRAUER, F. In A. Fedtschenko's *Puteshestvie v Turkestan* [Travels in Turkestan], *Odonata*, pp. 1-11.

A list (with localities, &c.) of 25 known species found by Fedtschenko in Turkestan, all (with one or two exceptions) European. Includes 8 species of *Libellulina*, 3 of *Æschnina*, 4 of *Gomphina*, 1 of *Calopterygina*, and 9 of *Agrionina*.

McLACHLAN, R. Article "Dragon-fly" in *Encyc. Brit.*, 9th edition, vii. pp. 385-389, with woodcuts.

WILLIAMS, JOSEPH. Dragon-flies. *Rep. Soc. Ont.* 1877, pp. 52-55.

A popular article, with woodcuts illustrative of some of the more common Canadian species.

Notes on species collected during the voyage of H.M.S. "Peterel" to the Galapagos Islands, with descriptions and woodcuts of two nymphs, referred to *Pantala hymenæa*, Say, and *Tramea*, sp.? McLachlan, *P. Z. S.* 1877, pp. 84-87.

Corduliina.

Æschna yamaskanensis, Provancher, belongs to this sub-family, and is renamed *Epitheca yamaskanensis*; Provancher, *Nat. Canad.* ix. p. 86.

Æschnidæ.

Gynacantha plagiata, sp. n., C. O. Waterhouse, *P. E. Soc.* 1877, p. x., Borneo.

Agrionina.

McLACHLAN, R. On some new and little known forms of *Agrionina* (*Légion Pseudostigma*, De Selys). *Ent. M. M.* xiv. pp. 86-88.

SELYS-LONGCHAMPS, E. DE. Synopsis des Agrionines. 5^{me}. *Légion, Agrion* (suite et fin). Les genres *Telebasis*, *Argiocnemis*, et *Hemiphlebia*. Bruxelles: 1877, 8vo, pp. 1-65. Published also in *Bull. Ac. Belg.* (2) xliii. pp. 97-159.

Concludes this Synopsis [*cf. Zool. Rec.* xiii. *Ins.* p. 206]. The genus *Telebasis* includes the following sub-genera:—

Section 1.—Wings ceasing to be petiolated at the basal post-costal nervule before the level of the second ante-cubital nervule and of the quadrilateral.

- A. Without post-ocular spots *Leptobasis* (subg. n.).
- B. With post-ocular spots *Stenobasis* (subg. n.).

Section 2.—Wings ceasing to be petiolated beyond the basal post-costal nervule, on a level with the second ante-cubital, and of the quadrilateral (or even beyond it). No post-ocular spots.

a. Pterostigma quadrate, or of an oblique lozenge-shape, followed by a single row of costal cellules.

a. Coloration scarcely metallic. Superior appendages of the ♂ sub-cylindrical, simple, the inferior divided into two superposed branches *Telebasis.*

b. Coloration metallic. Appendages long, the superior of the ♂ semicircular, toothed, the inferior slender and simple *Amphicnemis.**

b. Pterostigma pentagonal, followed by two rows of cellules (appendages unknown) *Pericnemis.**

Argiocnemis includes the two already indicated sub-genera *Argiocnemis* and *Agriocnemis*. *Hemiphlebia* contains only the one original species. The following are the spp. nn. (or named races) described :—

Leptobasis vacillans (Hag.), p. 7, Cuba, *dicerus*, p. 8, Para, *bicornis*, p. 9, Amazons, *quadricornis*, p. 10, Para, *rosea* (Bates), p. 11, Amazons.

Stenobasis oscillans, p. 14, Banka or Siam, *melanocyana*, p. 16, Malacca, *♀ occipitalis*, p. 17, New Guinea.

Telebasis recurva, p. 20, Mindanao, *superba* (Hag.), *ibid.*, Celebes and Moluccas, *pretiosa*, p. 22, New Guinea, *prothoracica*, p. 23, Mysol, *lorquini*, p. 24, Moluccas, *ruficollis*, p. 25, Singapore, *combusta*, p. 26, Sulu, *rufithorax*, p. 28, Obi.

Argiocnemis rubescens, p. 42, Queensland, *rubeola*, p. 43, Malacca, Celebes, Java, race ? *intermedia*, p. 44, Luzon, *lunulata*, p. 45, Malacca, Celebes, Sulu, *nigricans*, p. 46, New Guinea, Labuan, Java.

Agriocnemis lacteola, p. 50, Bengal, *minima*, p. 51, Java, *exsudans*, p. 54, New Caledonia, *incisa*, race ? *pulverulans*, p. 56, Celebes, Borneo ?, *materna* (Hag.), Sumatra, *maclachlani*, p. 58, Gaboon, Senegal, *carmelita*, p. 61, Annam, *australis*, *ibid.*, Queensland.

Anomisma, g. n., McLachlan, *l. c.* p. 87. Allied to *Microstigma*; differs from all known *Agrionina* by the quadrilateral being reticulated with transverse nervules. *A. abnorme*, sp. n., *id. ibid.*, East Peru.

Microstigma terminatum, sp. n., *id. ibid.*, East Peru.

Mecistogaster astictus, Hag., ♂ described, *id.* p. 88; *M. jocaste*, notes on, *id. ibid.*

Agrion canadense, Provancher [*cf. Zool. Rec. xiii. Ins. p. 209*], is only a variety of *A. civile*, Hag.; Provancher, Faune Entomologique du Canada, ii. fasc. i. interleaved p. 92 (2).

* The sub-genera *Amphicnemis* and *Pericnemis* are transferred here from the Légiton *Platycnemis*, published in 1863.—R. McL.

ORTHOPTERA.

BY

ROBERT McLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

- BOLIVAR, IGNACIO. Sinópsis de los Ortópteros de España y Portugal. An. Soc. Esp. vi. pp. 249-348, pls. iii.-v. (Continued from the previous vol.; comprises the *Locustidae*, which are worked out in a greatly detailed manner.)
- DODGE, G. M. New Species of *Orthoptera*. Canad. Ent. ix. pp. 111-113.
- KRAUSS, H. Orthopteren vom Senegal, gesammelt von Dr. Franz Steindachner. SB. Ak. Wien, lxxvi. Abth. i. pp. 29-63, pls. i. & ii.
- PROVANCHER, L. Faune Canadienne : Les Insectes, Orthoptères, additions et corrections. Nat. Canad. ix. pp. 289-290. Cf. Zool. Rec. xiii. Ins. p. 211. The whole of the *Orthoptera* are also included in the same author's "Faune Entomologique du Canada," vol. ii. fasc. i. pp. 1-53.
- SAUSSURE, H. DE. Mélanges Orthoptérologiques. Fasc. v., Gryllides. Genève, Bâle, et Lyon : 1877, pp. 169-504, pls. xi.-xv., 4to. (Published also in Mém. Soc. Phys. Genève. xxv. pp. 1-352.)
- SCUDDER, S. H. A Century of *Orthoptera*. Decade vii., *Acrydii*. P. Bost. Soc. xix. pp. 27-35.
- New forms of saltatorial *Orthoptera* from the Southern United States. L. c. pp. 35-41.
- The Florida *Orthoptera* collected by Mr. J. H. Comstock. L. c. pp. 80-94.
- STÅL, C. *Orthoptera nova ex Insulis Philippinis*. Öfv. Ak. Förh. xxxiv. No. 10, pp. 33-58.
- WOOD-MASON, JAMES. On a small collection of Orthopterous insects of the families *Phasmidae* and *Mantidae*, from Australia and New Britain, with descriptions of new species. Ann. N. H. (4) xx. pp. 74-77.
- Enumerates 8 species, 4 of which are new.

A list of species of all families taken at Cascante, in Navarre, is given by Bolivar, Act. Soc. Esp. vi. pp. 71 & 72.

A list of species found in Podolia is given by M. Lompicki in Sprawozd. Kom. fizyogr. xi. pp. 128-146.

A list of six species (one new) found during the voyage of H.M.S. "Peterel" to the Galapagos Islands, is given by A. G. Butler, P. Z. S. 1877, pp. 87 & 88.

R. P. Uhler gives a list of species captured by him when on the United States Geological Survey in 1875; one is described as new, and many others are not identified. Bull. U. S. Geol. Surv. iii. pp. 791-796.

FORFICULIDÆ.

The use of the forceps in *Forficula* is to lift the elytra in order to allow the wings to expand; J. G. Morris, Canad. Ent. ix. pp. 218 & 219.

BLATTIDÆ.

GIRARD, MAURICE. La domestication des Blattes. Bull. Soc. Acclim. (3) iv. pp. 296-309.

A useful popular article, with illustrative woodcuts, on the various species found in houses, &c. See also (so far as *Periplaneta americana* is concerned) "La Nature," v. pt. i. pp. 399 & 400.

New genera or subgenera :—

Nisibia, subg. of *Thyrrocera*. Type, *T. (N.) amœna*. Stål, Cfv. Ak. Förh. xxxiv. No. 10, p. 34, Philippines.

Dorylea, p. 36. For *Periplaneta flavicincta*, and *D. brunneri*, sp. n., p. 37, Philippines.

Cutilia, p. 36. For *Periplaneta triangulata*, *Polyzosteria soror*, and *C. tartarea*, sp. n., *ibid.*, Philippines.

Methana, *ibid.* For *Periplaneta pallipalpis* and *ligata*, Brun.

Salganea, p. 37, subg. of *Panesthia*. For *P. morio*, Burm.

Cæparia, *ibid.*, subg. of *Panesthia*. For *P. mandarinea*, Saussure.

New species :—

Thyrrocera (Pachnepteryx) signaticollis and *pallidicollis*, *T. (T.) lugubris*, *circumcincta*, *rufiventris*, and *semicincta*, Stål, l. c. p. 33, *circumclusa*, p. 34, Philippines.

Chorisoneura nigro-lineata, *ibid.*, Philippines.

Homalopteryx obscurifrons, *ibid.*, Philippines.

Epilampra puncticollis, *cribellata*, *rustica*, *plebeia*, *ibid.*, *tugatica*, *trivialis*, *caliginosa*, *lugubrina*, *meticulosa*, *ferruginosa*, *cryptophthalma*, *pubica*, p. 35, *imperatoria*, p. 36, Philippines.

Platyzosteria ingens, Scudder, P. Bost. Soc. xix. p. 92, *sabalianus*, p. 93, Florida.

Panesthia monstruosa, Wood-Mason, Ann. N. H. (4) xix. p. 117, S. India, *wallacei*, *ibid.*, near Singapore, *flavipennis*, *ibid.*, Nágá Hills, Brahmaputra Valley, &c., *saussurii* (= *mandarinea*, Sauss., ♀), p. 118, Sikkim;

P. saussurii and *puncticollis*, Stål, Cefv. Ak. Förh. xxxiv. No. 10, p. 37, Philippines.

Goldenberg, Fauna Saræpontana Fossilis, Heft ii., describes and figures the following (from the Carboniferous of Saarbruck) as new:—*Blattina wemmetsweileriensis*, p. 24, pl. i. fig. 9, *intermedia*, ibid. pl. i. fig. 10, *venosa*, p. 25, pl. i. fig. 7, *scaberata*, ibid. pl. i. fig. 8.

MANTIDÆ.

STÅL, C. Systema Mantodeorum; essai d'une systématisation nouvelle des Mantodées. Sv. Ak. Handl., Bihang iv. No. 10, with plate.

The short introduction is mainly occupied by reference to the characters furnished by certain spines on the legs, and the neuriation, to which the plate refers. It is followed by the author's usual elaborate analytical tables, &c. He divides the family into six sub-families, viz.:—*Amorphoscelidæ*, *Eremophilidæ*, *Mantidæ*, *Vatidæ*, *Harpagidæ*, and *Empusidæ*, all of which are differentiated in a table. The new genera and species are very numerous.

WOOD-MASON, J. Descriptions of two New Genera and Species of Indian *Mantidæ*. Ann. N. H. (4) xix. pp. 219–222.

This author's remarks on the femoral brushes of *Mantidæ*, and on the development of the antennæ in the pectinicorn species, (cf. Zool. Rec. xiii. Ins. p. 214) are abstracted in Ann. N. H. (4) xix. p. 269.

Phyllothelys westwoodi and *Hestias brunneriana*, their sexual differences; *id.*, P. E. Soc. 1877, p. xviii.

Gonyphus gongylodes, L. On mimetic resemblance to flowers in; J. O. Westwood, P. E. Soc. 1877, p. xxix.

Hymenopus bicornis, Serville, mimics flowers. J. Wood-Mason, *ibid.*

Mantis religiosa has been found near Civray (Dep. de Vienne), France; M. Bailliot, Feuil. Nat. vii. p. 132: also near Autun by Gillot, l. c. p. 156. The insect figured in conjunction with its parasite *Palmon pachymerus*, Walker (*Chalcididæ*); E. André, l. c. pp. 137 & 138, pl. iv. Occurs at Rohatetz in Moravia; F. Moraw, Verh. Ver. Brünn, xv. i. p. 47.

New genera:—

Annia, Stål, l. c. p. 10. Follows *Metalleutica*, Westwood; type, *Chætessa brunneriana*, Saussure.

Ariusidæ, p. 12. Follows *Eremophila*; type, *A. conspersa*, sp. n., p. 16, Damara Land.

Pyrgocotis, p. 14. Allied to *Pyrgomantis*; type, *P. gracilipes*, sp. n., p. 17, Ceylon.

Lygdamia, *ibid.* Allied to *Pyrgomantis*; includes *Chiropacha lenticularis* and *capitata*, Saussure.

Dysaules, p. 15. Follows *Episcopus*; type, *D. longicollis*, sp. n., p. 18, Bengal.

Arria, p. 20. Follows *Sibylla*; type, *A. cinctipes*, sp. n., p. 46, India.

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Myrcinus, p. 21. Follows *Oxyptilus*; type, *M. tuberosus*, sp. n., p. 46, Borneo.

Theopompa, p. 22. For *Humbertiella ophthalmica*, Oliv., and *servilii*, Saussure.

Elæa, ibid. Follows *Humbertiella* as restricted; type, *H. perlodes*, Saussure.

Hapalopeza, p. 23. Allied to *Gonypeta*; type, *Gonypeta (Iridopteryx) nitens*, Saussure.

Armene, p. 25. For *Ameles elatæ*, Saussure.

Entella, ibid. For *Gonypeta dedalandis*, Saussure.

Ligaria, ibid. Follows *Entella*; for *L. quadrinotata* and *brevicollis*, spp. nn., p. 50, Transvaal.

Bolbe, ibid. For *Ameles pygmæa*, Saussure.

Tropidomantis, p. 26. Allied to *Chroicoptera*; types, *Mantis terreæ*, Stål, and *guttatipennis*, sp. n., p. 51, India.

Fulcinia, p. 27. For *Nanomantis alaris*, Saussure.

Solygia, p. 32. For *Thespis sulcatifrons*, Serv.

Deiphobe, p. 33. For *Thespis ocellata*, Saussure.

Bolivaria, p. 34. For *Fischeria brachyptera*, Pallas.

Sphendale, ibid. For *Iris (Fischeria) infuscata*, Saussure.

Statilia, p. 36. For *Pseudomantis nemoralis* and *Mantis apicalis*, Saussure.

Callimantis, p. 39. For *Iris antillarum*, Saussure.

Tithrone, p. 42. For *Acontista roseipennis*, Saussure.

Ardesca, p. 43. Follows *Tithrone*; type, *A. vitreola*, sp. n., p. 63, Columbia.

Bantia, p. 44. For *Oligonyx pygmæa*, Saussure.

Astape, ibid. Follows *Bantia*; type, *A. denticollis*, sp. n., p. 65, locality unknown.

Callibia, p. 85. For *Harpax pictipennis*, Serv.

Galinthias, p. 86. For *Harpax (Pseudharpax) amena*, Saussure.

Helvia, p. 80. Type, *H. cardinalis*, sp. n., p. 86, Malacca.

Antissa, p. 81. For *Gonypeta (Iridopteryx) micans*, Saussure, = *pulcra* (sic), F.

Anaxarcha, ibid. Type, *A. graminea*, sp. n., p. 87, Darjeeling.

Ambivia, p. 82. Type, *A. popa*, sp. n., p. 88, Calcutta.

Antenna, p. 88. Type, *A. rapax*, sp. n., ibid., Chiriqui.

Metilia, p. 84. Type, *M. integra*, sp. n., p. 89, Brazil.

Decimia, ibid. For *Acanthops tessellata*, Charp.

Paradanuria (subg. n. of *Danuria*), Wood-Mason, l. c. p. 220. Formed to receive an Indian species, differing from the African typical forms in various points of structure in the legs, supra-anal plate, cerci, &c. Type, *P. orientalis*, sp. n., ibid., Bangalore.

Didymocorypha (subg. n. of *Schizocephala*), id. p. 221. Differentiated from the typical genus by several minor characters. Type, *D. ensifera*, sp. n., p. 222, Rajmahal Hills.

Æthalochoera, id. p. 308. Apparently combining the characters of *Blepharis*, *Phyllocrania*, and *Danuria* (not differentiated by diagnosis); formed for *Vates ashmoliana*, Westwood.

New species :—

- Paraoxyphilus lobifrons*, Stål, l. c. p. 8, Queensland.
Galepsus tenuis, p. 17, West Africa.
Tenodera platycephala, p. 56, locality unknown.
Hierodula dentifrons, ibid., Australia, *roseinervis*, p. 58, Madagascar
gracilicornis, ibid., Sarawak, *malaya*, ibid., Malacca, *lingulata*, p. 59, Java,
titania, ibid., Moluccas; *H. raptoria*, *parviceps*, *daphne*, and (*Rhombodera*)
phryne, id., Cefv. Ak. Förh. xxxiv. No. 10, p. 38, Philippines.
Thespis trifasciata, id., Sv. Ak. Handl. Bihang iv. p. 62, Bahia.
Photina breviceps, p. 64, Rio Janeiro.
Musonia lineatriventris, p. 66, Columbia.
Oligonyx uhleri, ibid., Louisiana; *O. graminis* (Bates, MS.), Scudder
P. Bost. Soc. xix. p. 90, Florida.
Oxyops acutipennis, Stål, l. c. p. 71, Peru, *media*, ibid., South Brazil,
obtusa, p. 72, Brazil.
Theoclytes pectinicornis, p. 73, Chiriqui, *serraticornis*, ibid., Antioquia.
Pseudovates longicollis, p. 74, Mexico, *brevicornis*, ibid., Columbia.
Empusa hedenborgi, p. 77, Nubia.
Harpax discolor, p. 85, Caffraria.
Creoboter episcopalis, p. 86, Borneo, *meleagris*, id., Cefv. Ak. Förh. xxxiv.
No. 10, p. 39, Philippines.
Acanthops falcata, id., Sv. Ak. Handl. Bihang iv. p. 90, New Granada,
erosula, ibid., Peru.
Theopompa tosta, id., Cefv. Ak. Förh. xxxiv. No. 10, p. 38, Philippines.
Gonypeta aspera, id. ibid., Philippines.
Odontomantis euphrosyne, id. ibid., Philippines.
Acromantis hesione, id. ibid., Philippines.
Archimantis australis, Wood-Mason, Ann. N. H. (4) xx. p. 76, North
Australia.

PHASMATIDÆ.

Stål, C. Espèces nouvelles de Phasmides. CR. Ent. Belg. xx. pp. lxii.
& lxviii.

Wood-Mason, J. Notes on Phasmidæ. J. A. S. B. xlv. pt. 2,
pp. 342-352, pls. i. & ii.

Phyllium pulchrifolium, Serville. A variety described from Batavia;
H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. xxxiii.

Entoria spinicornis, Stål, = *Bacillus westwoodi*, W.-M.; Wood-Mason,
l. c. p. 342.

The following known species are figured, either wholly or in detail,
by Wood-Mason, l. c.: *Bacteria shiva*, Westwood, ♂, pl. ii. fig. 3,
Lonchodes austeni, W.-M., ♂, pl. iii. fig. 4, *Phibalosoma westwoodi*, W.-M.,
♀, pl. iii. fig. 1, *Lopaphus iolas*, Westwood, ♀, pl. iii. fig. 2, *L. botanicus*,
Westwood, ♂, pl. ii. fig. 1, *L. baucis*, Westwood, ♂, pl. ii. fig. 2, *Phyllium*
westwoodi, W.-M., ♂, pl. iii. fig. 3.

New genera :—

Onchestus, Stål, l. c. p. lxiii. Allied to *Bactrododema*; types, *Lopaphus*
gorgus, Westw., and *Cyphocrania passimachus*, Westw.

Lysicles, id. *l. c.* p. lxiv. Allied to *Tropidoderus*; type, *L. hippolytus*, sp. n., p. lxv., Peak Downs, Australia.

Diagoras, id. *l. c.* p. lxvi. Allied to *Hermarchus*; type, *D. ephialtes*, sp. n., *ibid.*, Palau.

Nisyrys, id. *ibid.* Allied to *Xeroderus* and *Epicharmus*; types, *N. spinulosus*, Viti, and *N. amphibius*, Tonga, *ibid.*, spp. nn.

Eubulides, id. *l. c.* p. lxviii. Allied to *Theramenus*; type, *E. alutaceus*, sp. n., *ibid.*, Philippines.

Mnesilochus, id., *Œfv. Ak. Förh.* xxxiv. No. 10, p. 38. Allied to *Carausius*; type, *M. capreolus* and *hædulus*, *ibid.*, Philippines, spp. nn.

Mithrenes, id. *ibid.* Allied to *Lonchodes* and *Phrarortes*; type, *M. asperulus*, sp. n., p. 40, Philippines.

Periphetes, id., p. 40. Allied to *Phrarortes*; type, *Phasma graniferum*, Westwood.

Manduria, id. *ibid.* Allied to *Medaura*; type, *Lonchodes systropedon*, Westwood.

Pharmacis, id. *ibid.*, = *Phrynistria*, Div. A, Stål. Includes *P. ponderosa*, sp. n., id. *ibid.*, Philippines.

Thrasyllus, id. p. 41. Of the group of *Lonchodes*; type, *T. macilentus*, sp. n., *ibid.*, Philippines.

Lamachus, id. *ibid.* Near *Orxines*; type, *L. semperi*, sp. n., *ibid.*, Philippines.

Menaka, Wood-Mason, J. A. S. B. xlv. pt. 2, p. 342. Differs from *Sthenebæa*, &c., in its short filiform antennæ. Proposed for *Bacillus scabriusculus*, Wood-Mason, = *Sthenebæa brunneri*, Stål.

New species :—

Carausius mercurius, Stål, CR. Ent. Belg. xx. p. lxii. (no locality given).

Vetilia eurymedon, id. *l. c.* p. lxiii., Cape York, *thoon*, *ibid.*, Rockhampton.

Obrimus cavernosus and *echinatus*, id. *l. c.* p. lxviii., Philippines.

Theramenes dromedarius, id. *ibid.*, Philippines.

Clitumnus rusticus, id., *Œfv. Ak. Förh.* xxxiv. p. 40, Philippines.

Arrhidæus nigricornis, id., p. 41, Philippines.

Lonchodes valgus, Wood-Mason, Ann. N. H. (4) xix. p. 487, Perak, *godama*, id., P. A. S. B. vii. p. 162, Upper Tenasserim, *tagalicus*, Stål, *Œfv. Ak. Förh.* xxxiv. No. 10, p. 39, Philippines.

Bacteria frenchi, Wood-Mason, Ann. N. H. (4) xx. p. 74, N. Australia, *sinkiebensis*, id. J. A. S. B. xlyi. pt. 2, p. 343, Sinkie Island.

Phibalosoma novæ-britanniæ, id. Ann. N. H. (4) xx. p. 75, New Britain, *annamallayanum*, id., P. A. S. B. vii. p. 161, S. India.

Phyllium novæ-britanniæ, id. Ann. N. H. (4) xx. p. 75, New Britain (= *P. fejeanum*, Westwood; id. J. A. S. B. xlv. pt. 2, p. 351).

Necrosia menaka, id. J. A. S. B. xli. pt. 2, p. 130, Khasi Hills, *N. maculiceps*, *thisbe*, *flavo-guttata*, *fasciolata*, *nigro-granosa*, *ceres*, *conspersa*, Stål, *Œfv. Ak. Förh.* xxxiv. No. 10, p. 42, *virens*, *scabra*, *berenice*, *calliope*, *philippa*, *fatua*, p. 43, *euryнома*, *parvipennis*, *eucerca*, *icaris*, p. 44, Philippines.

GRYLLIDÆ.

PUNGUR, J. L'élytre des Gryllides de Hongrie. Term. füzetek, 1877, pp. 223-228, & 255-259, pl. xiii.

An explanation of the nomenclature of the system of neurulation in *Gryllus campestris*. (Printed in Hungarian at pp. 223-228, and in French at pp. 255-259.)

SAUSSURE, in fasc. v. of his 'Mélanges,' commences the *Gryllides*. After copious structural notes, he gives a table of the six tribes into which he divides the family, founded upon the form of the tarsi and the armature of the posterior tibiæ. These tribes are as follows: *Gryllotalpiens*, *Grylliens*, *Myrmecophilens*, *Ecanthiens*, *Trigonidiens*, and *Enopteriens*. The present fasciculus is occupied by the first three tribes. The *Gryllotalpiens* are sub-divided into three Légions, viz., *Gryllotalpites*, *Cylindrodites*, and *Tridactylites*; the *Grylliens* into five Légions, viz., *Nemobiites*, *Brachytrypites*, *Gryllites*, *Platyblemmites*, and *Gryllomorphites*; the *Myrmecophilens* into four Légions, viz., *Myrmecophilites*, *Mogisoplistites*, *Scleropterites*, and *Cachoplistites*. The plates are mostly occupied by details, and will be referred to only in connection with the new species.

Gryllotalpiens.

Gryllotalpa (Curtilla) devia, Saussure, l. c. p. 193, pl. xi., Cape of Good Hope; *G. (G.) fulvipes* (= *hirsuta* ?), p. 203, Singapore: spp. nn.

Cylindrodes kochi, sp. n., p. 208, pl. xi., New Holland.

Tridactylus riparius, p. 216, pl. xi., Sunda Isles, *capensis*, p. 218, Cape of Good Hope, spp. nn.

*Grylliens.**New genera:—*

Pseudonemobius, p. 234 (Légion *Nemobiites*). Analogous with *Nemobius*, but the elytra of the ♂ without drum, and the legs longer. Type, *P. pictus*, sp. n., p. 235, pl. xi., Kashmir.

Hemigryllus, p. 268 (Légion *Nemobiites*). Differs from all other genera of the family by the posterior metatarsi being flattened and channelled, and by the external inferior spur of the posterior tibiæ being very long, whereas the internal is almost rudimentary. Type, *H. krieckbaumeri*, sp. n., p. 269, pl. xii., Brazil.

Apterogryllus, p. 277 (Légion *Brachytrypites*). Forming the passage between *Apiotarsus* and *Brachytrypus*. Type, *A. brunnerianus*, sp. n., p. 277, pl. xiv., New Holland.

Macrogryllus, p. 281, subg. n. of *Brachytrypus*. Allied to the subgenus *Brachytrypus* by the shortness of the tarsi, and the armature of the tibiæ; differing in the form of the pronotum and structure of the drum. Type, *G. (M.) ephippium*, sp. n., *ibid.* pl. xiv., Java or Africa.

Gymnogryllus, p. 291, subg. n. of *Brachytrypus*. Differing from the

subgenus of that name by the anterior metatarsi being moderate; anterior and intermediate tibiæ with long fringes; ovipositor moderate or aborted; drum of the ♂ long. Includes *Gryllus elegans*, Guérin, *humeralis*, Walker, *erythrocephalus*, F., and *pulvillatus*, p. 292, Java, *angustus*, p. 294, pl. xiv., Java, and *micurus*, p. 299, Gaboon, spp. nn.

Acanthogryllus, p. 300 (Légion *Brachytrypites*). Differs from its allies by the form of the pronotum, its velvety body, by the armature of the posterior tibiæ, &c. Type, *Gryllus fortipes*, Walker.

Liogryllus, p. 302 (Légion *Brachytrypites*). Posterior tibiæ normal, unarmed at the base; body and femora glabrous. Includes *Acheta morio*, F., *Gryllus campestris*, L., *bimaculatus*, De Geer, and *L. ritsemæ*, sp. n., p. 304, Japan.

Miogryllus, p. 362, "section" of *Gryllus*, comprising species of very small size, with the elytra more or less abbreviated; ♂ with only two oblique veins. Includes several known species, such as *pusillus*, Burm., &c.

Cophogryllus, p. 400. Differs from apterous species of *Gryllodes* by the anterior tibiæ having no drum. Includes *Gryllus physomerus*, Gerst., *pustulipes*, Walker, ♂ only (renamed *walkeri*, p. 401), and *delalandi*, p. 402, pl. xiii., S. Africa, *erzonus*, p. 403, pl. xiii., Java, and *albipalpus*, p. 404, pl. xiii., India, spp. nn.

Scapsipedus, p. 407 (Légion *Platyblemmites*). ♂ with the head formed almost as in *Gryllus*, that of the ♀ almost as in the ♀ of *Loxoblemmus*. Includes *Acheta marginata*, Afz., and *S. limbatus*, p. 409, pl. xiii., Madagascar, *felderi*, p. 410, Madagascar and Sennaar, *africanus*, p. 412, pl. xiii., W. Africa, *hastatus*, p. 413, Himalaya, *mandibularis*, p. 414, pl. xiii., India and Japan, and *micado*, Japan and Celebes, spp. nn.

Homaloblemmus, p. 416. Differs from *Scapsipedus* by the protubercance of the head not being swollen and rounded, but transversely carinate, and by the elytra of the ♀ being rudimentary. Type, *H. zam-besi* [?], sp. n., p. 416, pl. xiii., Zambesi.

Loxoblemmus, p. 417. Differs from *Platyblemmus* by the rostrum being blunt and rounded, never acute or angular. Includes *Gryllus pallens* and *Platyblemmus delectus*, Serv., and *L. equestris*, p. 420, pl. xiii., Celebes and Java, *arietulus*, p. 421, Java, Sumatra, and Japan, *taicoun*, p. 424, Japan and Java, *haani*, p. 425, pl. xiii., Java, and *parabolicus*, p. 426, pl. xiii., Java, spp. nn.

Stephoblemmus, p. 427. Between *Loxoblemmus* and *Platyblemmus*. Allied to the former in the structure of its feet and tibiæ; and to the latter by the broad lamellar process of the head, &c. Type, *S. humbertiellus*, sp. n., p. 428, pl. xiii., Ceylon.

Odontogryllus, p. 446 (Légion *Gryllomorphites*). With the facies of *Landrevus*, but the superior internal spur of the posterior tibiæ is very short compared with that of the intermediate; the armature of the internal border as in the external. Type, *O. setosus*, sp. n., p. 449, pl. xiv., Peru.

Anurogryllus, p. 451 (Légion *Brachytripes*, appendix). Differs from *Brachytrypus* by the ocelli being arranged in a triangle. Includes *Gryllus muticus*, De Geer, *Gryllodes darazianus*, *antillarum*, and *abor-*

tivus, Sauss., and *A. australis*, p. 453, New Holland, and *brevicaudatus*, p. 454, Bahia, spp. nn.

New species :—

Nemobius major, id. *l. c.* p. 243, Brazil, *annulipes*, p. 245, New Holland, *æthiops*, p. 250, Congo, *grandidieri*, *ibid.*, Madagascar, *infernalis* and *novaræ*, p. 251, Java, *javanus*, p. 253, Java, *ceylonicus*, p. 254, Ceylon, *rufus*, p. 256, Brazil, *albipalpus*, p. 257, Rio de Janeiro, *truncatus*, p. 259, New Holland, *dentatus*, *ibid.*, Samoa, *femoratus*, p. 260, pl. xi., New Holland, *malgachus*, p. 262, Madagascar, *nigritus* and *histrion*, p. 263, Java, *pulex*, p. 264, N. Australia, *acrobatus*, p. 266, Tropical Africa, *bicolor*, *ibid.* pl. xi., India; *N. carolinus*, Scudder, P. Bost. Soc. xix. p. 36, N. Carolina, *volaticus*, *ibid.*, Georgia, *socius*, p. 37, Georgia, *ambitiosus*, p. 81, Florida.

Apiotarsus gryllacroides (Brunner), Saussure, *l. c.* p. 275, pl. xiv., Viti.

Brachytrypus (B.) *grandidieri*, id. p. 287, Madagascar.

Gryllus miopteryx, id. p. 320, pl. xii., Peru, *infernalis*, p. 324, China, *afer*, p. 327, Mozambique, Algoa Bay, and Madagascar, *gracilipes*, p. 328, pl. xii., India; Tropical Africa, New Guinea, and Sunda Isles, *longipennis*, p. 329, pl. xii., India, *niger*, p. 332, India and Java, *ignobilis*, p. 333, Java, *plebeius*, *ibid.*, Philippines, *quadristrigatus*, p. 334, Tropical Africa and India, *typhographicus*, p. 336, Zanzibar, *quadrimaculatus*, p. 340, India, *ornaticeps*, p. 346, Gold Coast, *vaginalis*, p. 356, Java (also India and Africa?), *consobrinus*, p. 356, pl. xii., India, Siam, China, Java, Sumatra, Philippines, Senegal, E. Africa, *cyprinus*, p. 358, Cyprus, *algius*, p. 359, pl. xii., Algiers and Asia Minor, *clavellus*, p. 360, pl. xii., Java, *ambulator*, p. 361, pl. xii., uncertain locality; *G. saussurii*, Scudder, P. Bost. Soc. xix. p. 35, Georgia.

Grylloides episcopus, Saussure, *l. c.* p. 369, pl. xiii., Gold Coast, *apricus*, p. 371, Egypt, *berthellus*, p. 373, Japan, Amboyna, Banca, Amoy, *hebraeus*, p. 374, pl. xiii., Palestine, *hemelytrus*, p. 376, Java, *kirschii*, p. 377, Java, *maorius*, *ibid.*, New Zealand, *hofmanni*, p. 379, Tropical Africa, *fistulator*, p. 380, Melbourne, *flavispina*, p. 381, New Holland (? S. Africa), *extraneus*, p. 382, Flores, *biennus*, p. 383, Java, *guyennensis*, p. 384, Surinam, *debilis*, p. 385, Borneo, *imbecillus*, p. 386, Borneo, *cantans*, p. 389, India, *niloticus*, *ibid.*, Egypt, *terrestris*, p. 392, Turkestan, *saltator*, p. 394, Central Africa, *toltecus*, p. 396, Mexico, *histrion*, p. 397, India, *falconneti*, p. 398, Central India, *furcatus*, p. 399, pl. xiii., Central India.

Platyblemmus barbarus, id. p. 435, pl. xiii., Morocco.

Landrevus hector, id. p. 440, pl. xiv., Bourbon, *coulonianus*, p. 441, pl. xiv., Java, *rostratus*, p. 442, pl. xiv., Amboyna and New Guinea, *ritsemæ*, p. 444, pl. xiv., Java, *pictus*, p. 445, Ceylon.

Loxoblemmus histrionicus, *satellitius*, *monstrosus*, Stål, *l. c.* p. 48, Philippines.

Myrmecophilienæ.

New genera :—

Liphoplus, Saussure, *l. c.* p. 483 (*Légion Mogisoplastites*). Differs from *Arachnocephalus* by the anterior tibiæ being furnished with a drum,

and by the ♂ being winged; from *Ectatoderus* by the facial protuberance being divided. Types, *L. novaræ*, *ibid.*, Taiti, and *guerinianus*, p. 484, locality unknown, spp. nn.

Acanthoplistus, p. 486, *Acanthoplus* in explanation of plate (Légion *Scleropterites*). Exceptional in the tribe in consequence of the posterior tibiæ being furnished with spines, as in the *Grylliens*. Types, *A. carinatus*, p. 488, pl. xv., Central Africa, *acutus*, p. 489, W. Africa, and *birmanus*, p. 490, pl. xv., Birma, spp. nn.

New species :—

Myrmecophilus dubius, Saussure, *l. c.* p. 461, Bitang, *americanus*, *ibid.*, Colombia.

Mogisoptilus occultus, *id.* p. 467, Chili, *tridentatus*, p. 468, Guinea.

Ectatoderus longicaudus, *id.* p. 472, Nicobar Isles, *elatus*, p. 474, Brazil, *loricatus*, *ibid.*, Guinea, *varicolor*, p. 475, pl. xv., locality unknown; *abdominalis*, Stål, *l. c.* p. 48, Philippines.

Cycloptilus brasiliensis, Saussure, *l. c.* p. 477, Brazil.

Arachnocephalus yersini, *id.* p. 479, pl. xv., Hyères, *dalmatinus*, p. 480, Dalmatia, *steini*, p. 481, Iuzon, *maritimus*, *ibid.*, Viti, Amboyna, *brunnerianus*, p. 482, Celebes, *dewitzi*, p. 483, Manilla.

Cachoplistus brunnerianus, *id.* p. 495, pl. xv., Australia, *rogenhoferi*, p. 497, pl. xv., Kashmir, *westwoodianus*, p. 498, pl. xv., New Holland?.

Pteroplistus acinaceus, *id.* p. 501, pl. xv., Malacca.

Æcanthiens.

New genera :—

Tremellia, Stål, *l. c.* p. 49. Allied to *Amphicausta*; type, *T. spurca*, *ibid.*, Philippines, sp. n.

Phaloria, *id. ibid.* Allied to *Amphicausta*; type, *P. amplipennis*, *ibid.*, Philippines, sp. n.

Strophia, *id. ibid.* Allied to *Amphicausta*; type, *S. lugubrina*, *ibid.*, Philippines, sp. n.

Vescelia, *id. ibid.* Allied to *Amphicausta*; type, *V. infumata*, *ibid.*, Philippines, sp. n.

Trigonidiens.

Metioche, g. n., Stål, *l. c.* p. 48. Allied to *Trigonidium*; type, *M. lepidula*, *ibid.*, Philippines, sp. n.

Enopteriens.

New genera and species :—

Lebinthus, Stål, *l. c.* p. 50. Allied to *Platydictylus*; type, *L. bite-niatus*, *ibid.*, Philippines, sp. n.

Mnesibulus, *id. ibid.* Allied to *Paræcanthus*; types, *M. lineolatus* and *splendidulus*, p. 51, Philippines, spp. nn.

Munda, *id. ibid.* Allied to *Euscirtus*; type, *M. picturata*, p. 51, Philippines, sp. n.

Paticus, subg. n. of *Euscirtus*, id. p. 51. Includes *E. dorsalis*, *pallidus*, and *tagalicus*, *ibid.*, Philippines, spp. nn.

Paræcanthus conspersus, *saussurii*, id. l. c. p. 50, *fuscinervis*, *cinereus*, p. 51, Philippines, spp. nn.

Euscirtus subapterus, sp. n., id. p. 52, Philippines.

Cyrtozipha delicatula, sp. n., Scudder, P. Bost. Soc. xix. p. 82, Florida.

LOCUSTIDÆ.

BERTKAU, P. Ueber das Eierlegen der Locustiden. SB. Ver. Rheinl. xxxiii. pp. 239-243.

Especially concerns *Meconema varium* and *Odontura punctatissima*, in both of which the author noticed that the eggs are deposited singly in fissures of the bark of trees.

BRUNNER VON WATTENWYL, C. Einleitung zu der Monographie der Phaneroptiden. Verh. z.-b. Wien, xxvii. pp. 625-628.

These notes may be regarded as forming a prospectus to the author's monograph of the group announced as ready for publication, and which has since (in 1878) appeared.

CHATIN, J. Sur la coloration des éléments optiques chez la *Locusta viridissima*. C. R. lxxxv. pp. 447 & 448. [Abstracted in Ann. N. H. (4) xx. p. 542.]

Platyphyllum giganteum, Marion, female described; H. Lucas, Bull. Soc. Ent. Fr. (5) vii. p. xx.

New genera :—

Morismus, Stål, Cefv. Ak. Förh. xxxiv. No. 10, p. 44. Allied to *Ononarchus*; type, *M. areatus*, sp. n., *ibid.*, Philippines.

Timanthes, id. p. 45. Allied to *Phyllomimus*; type, *T. signatipennis*, sp. n., *ibid.*, Philippines.

Olcinia, id. *ibid.* Allied to *Sathrophyllia* and *Tarpha*; type, *O. erosi-folia*, sp. n., *ibid.*, Philippines.

Segestes, id. *ibid.* Allied to *Moristus*; type, *S. vittaticeps*, sp. n., *ibid.*, Philippines.

Azylus, id. p. 46. Allied to *Teuthras*; type, *A. castaneus*, sp. n., p. 46, Philippines.

Ctenodecticus, Bolivar, An. Soc. Esp. vi. p. 332. Allied to *Thamnotrizon*, but having the first joint of the posterior tarsi of the ♂ shorter than the second. Type, *C. pupulus*, sp. n., p. 334, pl. v. fig. 1, Spain.

Ægipan, Scudder, P. Bost. Soc. xix. p. 38. Allied to *Acrometropa*; types, *Æ. grallator*, p. 39, Texas, and *phalangium*, p. 40, Georgia, spp. nn.

New species :—

Cratylus obesus, Stål, l. c. p. 44, Philippines.

Phyllomimus reticulosus and *integer*, id. p. 45, Philippines.

Salomona conspersa, *maculifrons*, and *brevicollis*, id. p. 46, Philippines.

Teuthras gracilipes, id. *ibid.*, Philippines.

Pyrgocorypha antennalis, Stål, l. c. p. 46, Philippines.

Xiphidium spinipes, id. p. 47, Philippines.

Gryllacris princeps, *biguttata*, *maculipennis*, *pustulata*, *limbatocollis*, *fuscinervis*, *plebeia*, id. p. 47, *punctifrons*, *brevispina*, p. 48, Philippines.

Ephippiger brunneri, Bolívar, l. c. p. 272, pl. iii. fig. 4, *surcularius*, p. 273, pl. iv. fig. 9, *secanii*, p. 279, pl. iii. fig. 7, *perezii*, p. 282, pl. iii. fig. 9, *stalii*, p. 284, pl. iii. fig. 11, *durieni*, p. 285, pl. iii. fig. 10, *zapteri*, p. 288, pl. iv. fig. 7, *cunii*, p. 290, pl. iii. fig. 12, *areolarius*, p. 292, pl. iv. fig. 8, *carinatus*, p. 294, pl. iv. fig. 5, *paulinoi*, p. 297, pl. iv. fig. 3, all from the Iberian Peninsula.

Platycleis andalusicus, id. l. c. p. 331, Spain.

Orchelimum senegalense, Krauss, SB. Ak. Wien, lxxvi. Abth. 1, p. 60, pl. i. fig. 12, Bakel, Senegal.

Agræcia cooksoni, Butler, P. Z. S. 1877, p. 87, Galapagos Islands.

Hadencus puteanus, Scudder, l. c. p. 37, North Carolina and Mississippi.

ACRYDIDÆ.

Acrydium peregrinum, L. De Selys-Longchamps, OR. Ent. Belg. xx. pp. x.-xii. & lx.-lxii., enters into an examination of the geographical distribution of this species, which has visited Europe on more than one occasion. He indicates two varieties, one yellow, originating in the North of Africa (observed in Corfu, in 1866), the other rose, originating in Senegal (observed in Britain in 1869, and S.W. Spain in 1876).

Caloptenus spretus. Prominent amongst the numerous American publications on this insect is, "The Locust Plague in the United States, being more particularly a treatise on the Rocky Mountain Locust, &c.," by C. V. Riley (Chicago: 1877, p. 231, 8vo, illustrated with plates, maps, and many woodcuts). It is little more than a reprint of his articles in the annual Rep. Ins. Mo., already noticed in former Records, but in a useful popular form. (Reviewed in Ent. M. M. xiv. p. 118). The same author occupies pp. 57-124 of his Rep. Ins. Mo. vii. (1877) by considerations respecting the same insect, the greater part of which are reproduced in the work noticed above, and gives a popular summary in Am. Nat. xi. pp. 663-673, republished in Canad. Nat. viii. pp. 363-374. Packard, l. c. pp. 22-29, discusses the causes of the migration of the annual swarms, and their correlation with meteorological influences. Le Conte, P. Ac. Philad. 1877, pp. 129-131, suggests the course to pursue in order to combat the ravages. G. M. Dawson, Canad. Nat. viii. pp. 207-226, publishes "Notes on the appearance and migrations of the Locusts in Manitoba and the North-West Territories: Summer of 1875." See also the Bulletins of the United States Entomological Commission, Nos. 1 & 2 (No. 1 appeared in two editions).

Under the title of "Locusts in Yorkshire," W. D. Roebuck gives a chronological summary of the appearance of large species of this family in the county, with general allusions to occurrences in Britain. *Pachytylus cinerascens* is probably the most frequent visitor, but *migratorius* is no doubt included, and there is a suspicion of *Acrydium peregrinum*. Naturalist, ii. pp. 129-137, 145-150.

New genera :—

Acorypha, Krauss, SB. Ak. Wien, lxxvi. Abth. 1, p. 38. Allied to *Caloptenus*, differs in the form of the vertex and pronotum; type, *A. picta*, sp. n., p. 39, pl. i. fig. 4, Senegal.

Hieroglyphus, id. l. c. p. 41. Allied to *Oxya*, but with the head thicker in proportion to the pronotum; the lobes of the metasternum not pressed against each other in the ♀; the anal parts different, &c. Type, *H. daganensis*, sp. n., p. 42, pl. i. fig. 6, Senegal. *Acridium (Oxya) furcifer*, Serv., also belongs to the genus.

Spathosternum, id. l. c. p. 44. Allied to *Oxya*; differs in the form of the prosternal process. Type, *Tristria nigro-teniatus*, Stål.

Brachycrotaphus, id. l. c. p. 47. Between *Ischnacrida* and *Mesops*; differing from both in the convex anterior extremity of the head, &c. Type, *B. steindachneri*, sp. n., p. 48, pl. ii. fig. 15, Senegal.

Paroxya, Scudder, P. Bost. Soc. xix. p. 28. Differs from *Oxya* in the separated metasternal lobes of the ♀, the blunt tips of the geniculations of the hind femora, and the want of lateral carinæ on the upper surface of the hind tibiæ. Types, *P. atlantica*, p. 29, Connecticut, Georgia, &c., and *recta*, p. 30, Georgia and Florida, spp. nn.

Aptenopedes, id. l. c. p. 83. In aspect not unlike *Sphenarium*, but belongs to the *Acridiidae*, and appears to be allied to *Rhytidochrota*. Includes *A. sphenarioides*, p. 84, *rufo-vittata*, p. 85, and *aptera*, p. 86, Florida, spp. nn.

Mestra, Stål, Öfv. Ak. Förh. xxxiv. No. 10, p. 52. Allied to *Atractomorpha*. Types, *M. hoplosterna* and *anoplosterna*, *ibid.*, Philippines, spp. nn.

Euthynous, id. p. 53. Allied to *Amycha* and *Macharidia*. Type, *E. caerulea*, sp. n., p. 54, Philippines.

Mnesicles, id. p. 54. Allied to *Mastax* and *Erucius*. Type, *M. modestus*, sp. n., *ibid.*, Philippines.

Misythus, id. *ibid.* Allied to *Cladonotus*. Includes *M. appendiculatus*, *histrionicus*, and *laminatus*, p. 55, Philippines, spp. nn.

Diotarus, id. p. 55. Allied to the last. Type, *D. verrucifer*, sp. n., Philippines.

Mnesarchus, id. *ibid.* Allied to *Tettix*. Includes *M. scabridus*, sp. n., Philippines, and *Tettix balzebuth*.

Arulenus, id. *ibid.* Same affinities. Type, *A. validispinus* and *punctatus*, p. 56, spp. nn., Philippines.

Spartolus, id. p. 56. Allied to *Tettix*. Types, *S. longiceps* and *pugionatus*, *ibid.*, spp. nn., Philippines.

Cleostratus, id. *ibid.* Same affinities. Types, *C. monocerus* and *longifrons*, *ibid.*, spp. nn., Philippines.

New species :—

Acrydium anguliferum, Krauss, l. c. p. 31, pl. i. fig. 1, Senegal; *geniculatum*, *vittaticolle*, *cognatum*, and *gramineum*, Stål, Öfv. Ak. Förh. xxxiv. No. 10, p. 53, Philippines.

Coptacra variolosa, Krauss, *l. c.* p. 33, Senegal, *succineu*, p. 34, Sierra Leone and Natal; *cyanoptera*, Stål, *l. c.* p. 52, Philippines.

Cantatops stylifer, Krauss, *l. c.* p. 35, pl. i. fig. 2, and *hæmorrhoidalis*, p. 36, pl. i. fig. 3, Dagana, Senegal.

Caloptenus unicarinatus, id. *l. c.* p. 37, St. Louis, Senegal; *nigrescens*, Scudder, P. Bost. Soc. xix. p. 27, Georgia, *clypeatus*, *l. c.* p. 40, Georgia; *angustipennis*, Dodge, Canad. Ent. ix. p. 111, and *volucris* and *plumbum*, p. 112, Nebraska.

Euprepocnemis cymbifera, Krauss, *l. c.* p. 40, pl. i. fig. 5, Dagana, Senegal.

Ischnacrida natalensis, id. *l. c.* p. 46, pl. ii. fig. 17, D'Urban.

Mesops laticornis, id. *l. c.* p. 49, pl. ii. fig. 13, Bakel, Senegal, and Sierra Leone, *gracilicornis*, p. 51, pl. ii. fig. 14, Sierra Leone.

Phlæoba bisulcata, id. *l. c.* p. 52, St. Louis, Senegal.

Stenobothrus opacromioides, id. *l. c.* p. 54, St. Louis, Senegal; *lætus*, Uhler, Bull. U. S. Geol. Surv. iii. p. 792, Arkansas.

Stethophyma amabile, Krauss, *l. c.* p. 55, pl. i. fig. 1, Dagana, Senegal.

Pachytylus senegalensis, id. *l. c.* p. 56, pl. i. fig. 9, St. Louis and Dagana, Senegal.

Trilophidia antennata, id. *l. c.* p. 57, pl. i. fig. 10, St. Louis, Senegal.

Chrotogonus senegalensis, id. *l. c.* p. 58, pl. i. fig. 11, St. Louis, Senegal.

Pyrgomorpha cognata, id. *l. c.* p. 58, Dagana, Senegal.

Mermiria alacris, Scudder, P. Bost. Soc. xix. p. 30, Georgia.

Hippiscus lineatus, id. *l. c.* p. 31, Colorado.

Trimerotropis picta, id. *ibid.*, Florida and Georgia.

Leprus ingens, id. *l. c.* p. 32, California.

Brachystola behrensi, id. *l. c.* p. 33, Mexico.

Tettigidea obesa and *prorsa*, id. *l. c.* p. 34, Georgia.

Pezotettix rotundipennis, id. *l. c.* p. 86, and *puer*, p. 87, Florida; *P. abditum*, Dodge, Canad. Ent. ix. p. 113, Nebraska.

Chrysochraon obscurus, Scudder, *l. c.* p. 88, Florida.

Systella westwoodi, Stål, *l. c.* p. 52, Philippines.

Traulia pictilis, id. *ibid.*, Philippines.

Ozya lobata, id. p. 53, Philippines.

Macheridia macilenta, id. *ibid.*, Philippines.

Erucius bifasciatus, id. p. 54, Philippines.

Hymenotes sulcatus and *cultratus*, id. *ibid.*, Philippines.

Cladonotus echinatus, id. *ibid.*, Philippines.

Tettix dentifer, *spiculatus*, *palpatus*, *angusticeps*, *uncinatus*, *gallinaceus*, *rufipes*, id. p. 57, *fuscipes* and *corniculatus*, p. 58, Philippines.

RHYNCHOTA.

BY

E. C. RYE, F.Z.S., M.E.S.

DOUGLAS, J. W., & SCOTT, J. A Catalogue of British Hemiptera; Heteroptera and Homoptera (Cicadaria and Phytophthires). Published by The Entomological Society of London: 1876, 8vo, pp. 99.

174 genera and 441 species of *Heteroptera*, and 51 genera and 268 of (limited) *Homoptera*, are here recorded as British. Some orthographical corrections are made.

LETHIERRY, L. Relevé des Hémiptères recueillis en Portugal et en Espagne par M. C. Van Volxem en Mai et Juin, 1871. Ann. Ent. Belg. xx. pp. 34-43.

A list of names with localities. Five new species are described.

— Relevé des Hémiptères recueillis dans les environs de Tanger (Maroc) par M. Camille Van Volxem en Juillet, 1871. L. c. pp. 44-46.

One new species described.

— Catalogue des Hémiptères du Département du Nord. 2^{me}. édition. Mém. Soc. Lille, (4) i. [1876].

Rhynchota of East Colorado; P. R. Uhler, Bull. U. S. Geol. Surv. iii. pp. 365-475, pls. xxvii. & xxviii.

Captures of various interesting species [at Mt. de Marsan, presumably], with the names of the plants on which they were found; E. Perris, Ann. Soc. Ent. Fr. (5) vii. p. 386.

HEMIPTERA-HETEROPTERA.

GLOVER, TOWNEND. Manuscript Notes from my Journal, or Illustrations of Insects, Native and Foreign. Order Hemiptera, Suborder Heteroptera, or Plant-bugs. Washington, D. C.: 1876, 4to, pp. 132, 10 pls.

A few copies only appear to have been lithographed (in facsimile). With Uhler's assistance, the author has illustrated the leading types,

giving lists of predaceous species and remedies against their attacks. For notice, see *Am. Nat.* xi. p. 110.

JAKOWLEFF [*IACOVLEFF* in *Index*], B. *Novlia Polujestkokruilia*, Hemiptera Heteroptera, Astrachanskoi Faunoi. *Bull. Mosc.* lii. pt. 1, pp. 269-300 [*cf. Zool. Rec.* xi. p. 467, xii. p. 497].

Additions to the Heteropterous fauna of Astracan. In Russian, with Latin diagnoses.

REUTER, O. M. Hemiptera Gymnocerata Scandinaviæ et Fennia. Pars i. Cimicidæ (Capsina). Helsingfors (1875 on title), 8vo, pp. 1-206, pl. i.

Issued as a part of "*Acta Societatis pro Fauna et Flora Fennica*," vol. i., with date 1875-1877 on cover, and adding another to the author's already somewhat voluminous publications on the *Capsidæ* [*infra*]. The families adopted for the *Heteroptera* are *Cimicidæ* (= *Acanthiidae*, Reut., olim, *Isometopidae* and *Phytocoridae*, Fieb.), *Saldidæ*, *Reduviidæ*, *Hydrometridæ*, *Hebridæ*, *Phymatidæ*, *Aradidæ* (including *Tingididæ*), *Lygaidæ* (incl. *Pyrhacoridæ* and *Berytidæ*), *Coreidæ*, and *Pentatomidæ*.

— Remarks on some British Hemiptera-Heteroptera. *Ent. M. M.* xiv. pp. 11-14, 32-34, 60-62, 127-131.

The author, who has collected in this country, offers various critical remarks upon the species referred to Great Britain by Douglas & Scott, in connection with Saunders's *Synopsis*. Various explanatory notes are added by J. W. Douglas.

SWINTON, A. H. On stridulation in the Hemiptera-Heteroptera. *Ent. M. M.* xiv. pp. 29-31, figs.

General observations, with notices of 'limæ' in *Naucoris cimicoides*, *Nepa cinerea*, *Coriza*, and *Notonecta*.

VOLLENHOVEN, S. C. SNELLEN VAN. De Inlandsche Hemipteren, beschreven en meerendels ook afgebeeld. VII. *Tijdschr. Ent.* xx. pp. 90-167, pls. vii.-x.

Continues descriptions and figures of Netherlands species, *Hebridæ*—*Corizidæ*, completing the *Heteroptera*.

Great Britain. New and rare species observed during 1874-76; F. B. White, *Ent.* x. pp. 9-15. England; E. Saunders, *Ent. M. M.* xiv. p. 164. Scotland; G. Norman, *tom. cit.* p. 165.

South European localities for various species; Puton, *Bull. Soc. Ent. Fr.* (5) vii. p. cxxiii.

Hungary. G. v. Horváth, *Term. füzetek*, 1877, p. 25, gives description of species of which the diagnoses appeared in *Pet. Nouv.* 1876.

Notes on species from Lake Nyassa; W. L. Distant, *Ent. M. M.* xiv. p. 132.

Synonymical observations. Horváth, *l. c.* p. 235; O. M. Reuter, *Pet. Nouv.* ii. p. 149.

Abnormal structure of antennæ; J. W. Douglas, *Ent. M. M.* xiii. p. 188, F. B. White, *op. cit.* xiv. p. 93.

PENTATOMIDÆ.

Cryptocrus comes, var. from Cameroons; *C. erotyloides* and *silphoides*, Walk., = *nigricollis*, Sign., varr., of which another var. is described from W. Africa; W. L. Distant, Ent. M. M. xiv. p. 75.

Hotea subfasciata, Westw., var. from Lake Nyassa; *id. l. c. p.* 133.

Descriptive summary of the North American *Cydnides*; P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 336 *et seq.*

Canthophorus maculipes, Muls., lives in all stages on a Valerian, *Centranthus angustifolius*; É. André, Feuil. Nat. vii. p. 35, viii. p. 8.

Strachia cognata, Fieb., is distinct from *dominula*, Harris, and is a maritime species; A. Puton, Bull. Soc. Ent. Fr. (5) vii. p. xi.

Euschistus spurculus, Stål, called "xumilis" by the natives, is made into a flour in Mexico; V. Signoret, quoting Sallé; *tom. cit.* p. xxxvi.

Gonielytrum circuliventre, Stål, ? = *Cyclogaster delegorguei*, Spin., differentiated from *C. pallidus*, Westw., and recorded from Lake Nyassa; W. L. Distant, *l. c. p.* 133.

New genera and species :—

Homaloporus, Uhler, *l. c. p.* 376. *Cydnides*: between *Macroporus*, Uhl., and *Æthus*, having the ostiolar canal short, ligulate, and obliquely indented next the tip. *H. congruus*, p. 377, Denver, Texas.

Rhytidoporus, *id. l. c. p.* 380. *Facies* of *Cydnus*: ostiolar canal short, narrow, subfusiform, with the ostiole at tip. *R. indentatus*, *ibid.*, Cuba, S. Florida.

Cryptoporus, *id. l. c. p.* 381. *Cydnides*: ostiolar canal obsolete, shorter than coxa, narrow-ligulate. *C. compactus*, p. 382, Galveston Island.

Lobonotus, *id. l. c. p.* 395. *Cydnides*: ostiolar orifice at inner end of an oval scale, which is placed exteriorly on the episternum: thorax with long and wide lateral lobes. *L. anthracinus*, *ibid.*, Texas.

Liotropis, *id. l. c. p.* 399. Resembles *Euschistus*, connecting it with the *Asopides*, having the lobate head and narrow rostrum of the former, and the general structure of the latter. *L. humeralis*, p. 400, Massachusetts, Maryland, Colorado, Georgia.

Neostrachia, E. Saunders, Ent. M. M. xiv. p. 103. *Pentatomides*: allied to *Bagrada*, differing in its elongate form, non-stylated eyes, and the elevated smooth anterior thoracic margin. *N. hellenica*, *ibid.*, Greece.

Podops annulicornis, B. Jakowleff, Bull. Mosc. lii. pt. 1, p. 280, Sarepta.

Coptosoma baeri, L. Lethierry, Bull. Soc. Ent. Fr. (5) vii. p. c., Manilla.

Cydnus oratulus [ovat-], sp. n., Jakowleff, *l. c. p.* 282, Astracan.

Cyrtomenus obtusus, Uhler, *l. c. p.* 369, Texas, Arizona, Mexico, and P. California.

Macroporus repetitus, *id. l. c. p.* 375, San Francisco.

Æthus communis, *id. l. c. p.* 379, Cuba, Florida, Texas.

Pangæus discrepans, *id. l. c. p.* 386, Indian Territory, California, Texas, &c.

Melanæthus robustus, Uhler, *l. c.* p. 390, Maryland, Massachusetts, *p. picinus*, p. 391, Pennsylvania.

Geotomus subtristis, p. 110, *jucundus*, p. 111, F. B. White, *Ann. N. H.* (4) xx., Hawaiian Isles.

Tesseratoma æthiops, p. 62, Isubu, *hornimani*, p. 63, Cameroons, spp. nn., W. L. Distant, *Ent. M. M.* xiv.

COREIDÆ.

Therapha nigradorsum, Puton, = *hyoscyami*, L., var.; A. Puton, *Bull. Soc. Ent. Fr.* (5) vii. p. xi.

Alydus tangiricus, sp. n., E. Saunders, *Ent. M. M.* xiv. p. 104, Tangiers.

LYGÆIDÆ.

Eremocoris plebeius, with 3-jointed antennæ (not broken); J. W. Douglas, *Ent. M. M.* xiii. p. 188.

Plinthisus. Observations on Horváth's memoir; J. W. Douglas, *Ent. M. M.* xiv. p. 19.

Camptocera, g. n., Jakowleff, *Bull. Mosc.* lii. pt. 1, p. 286. Allied to *Notochilus*. For *C. horwathi*, sp. n., p. 287, Astracan and Derbent.

Engistus unicolor, sp. n., *id. l. c.* p. 284, Astracan.

Geocoris decoratus, Uhler, *Bull. U. S. Geol. Surv.* iii. p. 410, Colorado; *G. jakowleffi*, Saunders, *Ent. M. M.* xiv. p. 103, Tangiers: spp. nn.

Oxycaenus roseus, sp. n., L. Lethierry, *Ann. Ent. Belg.* xx. p. 36, Gibraltar.

Bycanistes costalis, sp. n., *id. ibid.*, Casa-branca.

Plinthisus horwathi, sp. n., Saunders, *l. c.* p. 104, Besika Bay.

Peritrechus gracilicornis and var. *rhomboidalis*, Rouen, *meridionalis*, S. France, Syria, spp. nn., A. Puton, *Pet. Nouv.* ii. p. 117.

Drymus pumilio, sp. n., *id.* *Bull. Soc. Ent. Fr.* (5) vii. p. xxxv., Lille.

Scolopostethus lethierrii, sp. n., Jakowleff, *l. c.* p. 285, Astracan.

Notochilus (Taphropeltus) andræi, sp. n., Puton, *l. c.* p. xxxiv., Haute-Saône.

ANTHOCORIDÆ.

Cimex lectularius and *hirundinis*. On their habits; J. Leidy, *P. Ac. Philad.* 1877, p. 284. *C. hirundinis*, *columbarius*, and *pipistrelli*: general observations by Schenck, *Ent. Nachr.* iii. p. 182.

Piezostethus ciliatus, sp. n., Jakowleff, *Bull. Mosc.* lii. pt. 1. p. 300, Astracan.

Triphleps persequens, sp. n., F. B. White, *Ann. N. H.* (4) xx. p. 111, Hawaiian Isles.

Cardiastethus mundulus, sp. n., *id. ibid.*, Hawaiian Isles.

CAPSIDÆ.

O. M. REUTER, in his "Hemiptera Gymnocerata" [*anteâ*, p. 222], fully describes the Scandinavian and Finnish species of his sub-family *Capsina*,

family *Cimicidæ* (following Stål). The divisions adopted are on the same scheme as mentioned in Zool. Rec. xii. p. 497, for the European fauna. Much synonymy is given; *Phytocoris tilia*, varr. nn. *signata* and *cretacea*, p. 39; *P. longipennis*, Flor, varr. *decolorata* and *signata*, p. 40; *Oncotylus tanacetii*, Fieb., nec Fall., renamed *punctipes*, p. 160.

An *Orchis* from Bahia, with leaves blistered by one of the *Capsidæ*; P. E. Soc. 1877, p. xiii.

Phytocoris. O. M. Reuter, Ann. Soc. Ent. Fr. (5) vii. pp. 13-34, pl. ii., tabulates and describes the European species, of which he recognizes 27, with two unknown to him, figuring *P. distinctus*, D. & S., fig. 1, *filia*, F., var. *marmoratus*, D. & S., fig. 2, *femoralis*, fig. 3, *juniperi*, Frey-Gess., fig. 4, *novickii*, Fieb., fig. 5, *incanus*, Fieb., ♂, fig. 6, *signoretti*, Perr., fig. 7, and *albo-fasciatus*, Fieb., fig. 8. *P. distinctus*, Reut., nec D. & S., is renamed *intermedius*, p. 14; and some Thomsonian synonymy is hazarded.

Lygus pellucidus in Scotland; G. Norman, Ent. M. M. xiii. p. 188.

Litosoma. Table of the allied green species; *L. viridineris*, D. & S., nec Kirschb., *prasinus*, Saund., nec Fall., renamed *scotti*; O. M. Reuter, Ent. M. M. xiv. pp. 61 & 62.

Orthotylus viridineris, Kschb., new to Britain; *id. l. c.* p. 76.

Orthotylus and *Tinicephalus*. On the value of the hook in the wing-cell of the male as a generic character; O. M. Reuter, *l. c.* p. 130, E. Saunders, *l. c.* p. 125. *O. fuscescens*, Kschb., in Scotland; *id. l. c.* p. 105. *O. prasinus*, Fall., in England; *id. l. c.* p. 164, A. Buchan-Hepburn, *ibid.*

New genera and species :—

Labopidea, P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 415. Facies of *Labops*, but with less prominent and not fully pedunculated eyes. *L. chloriza*, p. 416, Utah.

Sthenarops, *id. l. c.* p. 418. [No differential remarks made.] *S. chloris*, Colorado, and *malina*, Massachusetts to Texas, and on the borders of Russian America, p. 419.

Pamerocoris, *id. l. c.* p. 424. Contour of the longer species of *Anthocoris*, but with pronotum and head like *Ozophora* and *Ligyrocoris*. While being an undoubted Phytocorid, this presents the features and characters of the *Lygoidæ* and *Anthocoridæ*, and assists the author's belief that the *Phytocoridæ* are the great central group of the Order. *P. anthocoroides*, p. 425, Denver, Canada, Baltimore, &c.

Piezocranum, G. Horváth, Term. fizetek, 1877, p. 92. Allied to *Orthocephalus*, Fieb., Reut., but with excavated frons, sub-pedunculated eyes, which are not near the apex of thorax, thorax more narrowed in front and very convexo-declivous, and inflated scutellum. *P. simulans*, p. 93, Buda.

Stenotus, B. Jakowleff, Bull. Mosc. lii. pt. 1, p. 288. *Phytocoraria*. For *S. sareptanus*, p. 288, Sarepta.

Phytocoris miridioides [mirido-], L. Lethierry, Ann. Ent. Belg. xx. p. 38, Loule, Tavira; *P. inops*, P. R. Uhler, Bull. U. S. Geol. Surv. iii. 1977. [VOL. XIV.]

p. 413, Lower Canada to Maryland; *P. brachymerus*, p. 18, Philippeville, Algeria, *albicans*, p. 29, Greece, and *punctum*, p. 30, O. M. Reuter, Ann. Soc. Ent. Fr. (5) vii.; *P. undulatus*, id., Deutsche E. Z. 1877, p. 26, Turkestan.

Calocoris elegans, p. 26, Syria, *fuscescens* and *histrio*, p. 27, *limbicollis* and *fuliginosus*, p. 29, *melanocephalus* and *biplagiatus*, p. 30, Greece, *Jakowleffi*, p. 28, Turkestan, Reuter, Deutsche E. Z. 1877; *C. capitatus*, Jakowleff, l. c. p. 290, Sarepta.

Megacelum strigipes, Reuter, l. c. p. 31, Greece; *M. fasciatum*, Uhler, l. c. p. 421, Colorado, Maryland, &c.

Brachycoleus steini, p. 31, Greece, *sex-vittatus*, p. 32, Cordova, Reuter, l. c.

Orthops scutellatus, Uhler, l. c. p. 421, Colorado.

Pædiciscytus sericeus, id. l. c. p. 422, Quebec to S. Florida.

Pachytoma rugicollis, Jakowleff, l. c. p. 292, Sarepta.

Idolocoris agilis, Uhler, l. c. p. 425, Colorado.

Orectoderus amænus, id. l. c. p. 426, Colorado, &c.

Globiceps fulvicollis, p. 293, Sarepta, *albipennis*, p. 294, Kharkov, Jakowleff, l. c.

Orshotylus minutus, id. l. c. p. 296, Astracan; *O. (Melanotrichus) luridus*, Reuter, Act. Fenn. i. p. 153, Finland.

Conostethus brevis, Reuter, Ent. M. M. xiv. p. 77, Scotland.

Macrocleus coagulatus, Uhler, l. c. p. 417, Colorado.

Amblytylus concolor, Jakowleff, l. c. p. 297, Jandyki.

Atractotomus debilicornis, Reuter, Act. Fenn. i. p. 174, Yläne.

Apocremnus albipes, Jakowleff, l. c. p. 298, Sarepta.

Psallus cognatus, id. *ibid.*, Sarepta.

TINGIDIDÆ.

Euryceru (Lacometopus) clavicornis, L. Notes on the economy of this insect in connection with *Teucrium chamaedrys*: E. André, Feuil. Nat. vii. p. 34; E. Frey-Gessner, *tom. cit.* p. 51; J. W. Douglas, Ent. M. M. xiii. p. 236; F. B. White, *tom. cit.* p. 233.

Eurycera teucrii on *Teucrium montanum*; E. Frey-Gessner, l. c. p. 51.

Monanthia trichonota, Puton, lives on *Phlomis lychnitis*, and Stål's description of it is incorrect; A. Puton, Bull. Soc. Ent. Fr. (5) vii. p. lxix.

Monanthia hellenica, sp. n., Puton, l. c. p. lxviii., Greece, Corfu.

HEBRIDÆ.

Hebrus ruficeps, Thoms., from Scotland; O. M. Reuter, Ent. M. M. xiv. p. 77; F. B. White, *tom. cit.* p. 117.

Merragata, g. n., F. B. White, Ann. N. H. (4) xx. p. 113. Very near *Hebrus*. *M. hebroides*, sp. n., p. 114, Hawaiian Isles.

Hebrus sobrinus, sp. n., P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 452, Colorado.

ARADIDÆ.

Aradus lawsoni, sp. n., E. Saunders, Ent. M. M. xiv. p. 59, England.

REDUVIIDÆ.

HORVÁTH, GEZA VON. A Magyarországi Rablópoloskák Átnézete. Term. füzetek, 1877, pp. 136–151.

A synopsis of the *Reduviides* of Hungary (12 spp. of *Nabina*, and 11 of *Reduviina*). All are described, with synonymy and bibliographical notices; none new.

Mecistocoris, g. n., Reuter, Pet. Nouv. ii. p. 181. Nearest *Centroscelis*, Jak.; for *M. lineatus*, sp. n., *ibid.*, Turkestan.

Harpactor trochantericus and *oschanani*, spp. nn., *id. ibid.*, Turkestan.

Nabis innotatus, *subrufus*, and *N. (?) lusciosus*, spp. nn., F. B. White, Ann. N. H. (4) xx. p. 112, Hawaiian Isles.

Oncocephalus philippinus, sp. n., L. Lethierry, Bull. Soc. Ent. Fr. (5) vii. p. ci., Manilla.

Catamarius nyassa, sp. n., Distant, Ent. M. M. xiv. p. 134, Nyassa.

Luteva insolida, sp. n., White, l. c. p. 113, Hawaiian Isles.

SALDIDÆ.

Species found by C. van Volxem in Belgium; G. v. Horváth, CR. Ent. Belg. xx. p. xvi.

Salda amena, O. M. Reuter, Öfv. Fin. Soc. xix. p. 31, Krasnoyarsk; *S. peltita*, p. 433, E. Massachusetts, *sphacelata*, p. 434, Massachusetts, Maryland, California, Cuba, *anthracina*, Pennsylvania, and *crassicornis*, Saskatchewan, p. 438, *polita*, p. 441, California, *deplanata*, p. 442, Canada to Texas, *reperta*, p. 447, Massachusetts, *elongata*, p. 448, British Columbia, *orbiculata*, p. 450, New York to Texas, California, P. R. Uhler, Bull. U. S. Geol. Surv. iii. : spp. nn.

HYDROMETRIDÆ.

Bæcula, Stål, = *Rhagovelia*, Mayr. Observations on the characters of this genus, of which 8 species are known (including *B. rubra* and *burmeisteri*, La Guaira, *mexicana*, Mexico, *aneipes*, Niagara, and *mayri*, Bourbon and Mauritius, indicated as new); V. Signoret, Bull. Soc. Ent. Fr. (5) vii. pp. liii.–lv.

Hydroessa leveillei [Levellæ], sp. n., Lethierry, *tom. cit.* p. ci., Manilla.

NAUCORIIDÆ.

Naucoris angustior, Lethierry, Ann. Ent. Belg. xx. p. 40, Portugal, Tangiers; *N. seminiger*, *id.* Bull. Soc. Ent. Fr. (5) vii. p. ci., Manilla: spp. nn.

Borborocoris volxemi, sp. n., *id.* Ann. Ent. Belg. xx. p. 41, Portugal (genus new to Europe).

CORIXIDÆ.

Corixa blackburni, F. B. White, Ann. N. H. (4) xx. p. 114, Hawaiian Isles; *C. tumida*, P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 454, Colorado: spp. nn.

Sigara proxima, sp. n., L. Lethierry, Bull. Soc. Ent. Fr. (5) vii. p. ci, Manilla.

HEMIPTERA-HOMOPTERA.

FIEBER, FRANZ XAVIER. Les Cicadines d'Europe d'après les originaux et les publications les plus récentes. Deuxième partie (suite): Descriptions des espèces. Traduit de l'allemand par Ferd. Reiber. R. Z. (3) v. pp. 1-45.

Continues descriptions of *Fulgoridæ* [see Zool. Rec. xiii. *Ins.* p. 230].

Homoptera near Norwich; J. Edwards, Ent. M. M. xiv. p. 44.

Homoptera flying in December; J. W. Douglas, *op. cit.* xiii. p. 189.

Methods of mounting available for microscope use; J. Edwards, *tom. cit.* pp. 237, 282.

CICADIDÆ.

General observations on stridulation in this family; A. H. Swinton, *op. cit.* xiv. pp. 78-81.

Cicada plebeia. G. Carlet, Ann. Sci. Nat. (6) v. Art. 5, pp. 1-35, pl. xi. A, describes and figures the musical apparatus, which contains all the phonetic elements of the higher animals, viz., a vibrating body, muscular motor power, and a thoracic-abdominal cavity.

Cicada montana stridulating in England; Jenner Weir, P. E. Soc. 1877, p. xiii. This doubted, but confirmed; *l. c.* p. xvi.

Cicada sp., in the pupal state, reported to dry up vines in Teheran by destroying the roots; C. E. Leprieur, Bull. Soc. Ent. Fr. (5) vii. p. lxxxii. (*cf.* A. Laboulbène, *tom. cit.* p. c.).

Tettigia orni, L., and *Cicadetta adusta*, Hag., in Hungary; G. v. Horváth, Term. füzetek, 1877, p. 93.

Cicada putnami, sp. n., P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 455, Colorado, Utah.

CERCOPIDÆ.

Aphrophora. Notes on the Italian species; F. Vismara, Bull. Ent. Ital. ix. p. 297.

Ptyelus. Observations on two divisions of the species, based on the bifurcation (*lineatus*, *spumarius*, &c.) or non-bifurcation (*exclamationis*, &c.) of the third sector nerve after its anastomosis with the second, resulting in the suggestion that some of the varieties of *spumarius* may

be entitled to specific rank; V. Signoret, Bull. Soc. Ent. Fr. (5) vii. p. xxi.

Aphrophora parvula, sp. n., Vismara, l. c. p. 300, Castiglioni d'Orcia.

MEMBRACIDÆ.

A. G. Butler, Cist. Ent. ii. pp. 205-222, pl. iii., gives a list of the species in his opinion referable to the following genera of *Smiliinæ*:—*Hille*, *Polyglypta*, *Entylia*, *Cyphonia*, *Ceresa*, and *Telamona*. He differs from the late Dr. Stål in some points of synonymy.

The following new genus and species are characterized:—

Glossonotus, p. 222; dorsal process of pronotum of tongue-like form. For *Telamona acuminata*.

Hille sulphurea, p. 206, fig. 1, Bogota.

Polyglypta reflexa, p. 207, fig. 2, Guatemala, *fusca*, p. 208, fig. 3, Mexico, *hordeacea*, fig. 4, Para, *tricolor*, fig. 5, Mexico, and Peru, p. 209.

Entylia inequalis, fig. 7, Guatemala, and *mira*, fig. 8, Mexico, p. 211, *turrita*, p. 212, fig. 9, Rio Janeiro.

Cyphonia formosa, fig. 6, Mexico, and *fasciata* (= *C. capra*, Walk. ?, nec Burm.), Brazil, p. 214.

Ceresa robusta, p. 216, fig. 10, *distans* and *rufescens*, p. 218, Brazil, *stali*, p. 217, fig. 11, Mexico.

Telamona projecta, p. 221, fig. 12 [in error 11], locality unknown, *molaris*, p. 222, fig. 13, Saskatchewan.

IASSIDÆ.

Atractotypus cinctus, Perris, = *Chiasmus translucidus*, Muls. & Rey, forma brachyptera; A. Puton, Bull. Soc. Ent. Fr. (5) vii. p. xi. V. Signoret, l. c. p. xxii., confirms the generic identity, but thinks there are two species, 1, *heydeni*, Kb., = *bifasciatus*, Fieb., = *cinctus*, Perr.; 2, *bicolor*, Sign., = *conspurcatus*, Perr., = *laboulbenii*, Perr., = *translucidus*, Sign.

Typhlocyba tilix, Geoffr., differentiated by the outer genital processes of the ♂, and described from England; J. Edwards, Ent. M. M. xiv. p. 132.

A sweet secretion produced on *Cercis siliquastrum* at Florence is attributed to a *Typhlocyba*; A. Targioni-Tozzetti, Bull. Ent. Ital. ix. p. 240.

Parapholis, g. n., P. R. Uhler, Bull. U. S. Geol. Surv. iii. p. 461. Aspect of *Eupelia*, but with head more symmetrically rounded and ocelli placed on back of vertex, a little in advance of the anterior line of eyes. *P. peltata*, sp. n., *ibid.*, Colorado, Cuba, Mexico, Massachusetts, &c.

Pachyops, g. n., *id.* l. c. p. 466. No differential characters given. *P. latus*, p. 466, Colorado, *robustus*, p. 467, New Mexico, Texas, spp. nu.

Gypona cinerea, sp. n., *id.* l. c. p. 460, Colorado, &c.

Glossocratus viridis, p. 462, Colorado, Canada, &c., *lineatus*, p. 463, *fenestratus*, p. 464, New Jersey, *vulneratus*, p. 464, Texas, spp. nn., *id. l. c.*

Bythoscopus ramentosus, sp. n., *id. l. c.* p. 465, Colorado.

Iassus excultus, p. 467, New York to Florida, *jucundus*, p. 469, Colorado, Texas, *plutonius*, Colorado, Texas, Dacota, *belli*, p. 471, *divisus*, p. 472, Colorado, spp. nn., *id. l. c.*

Dellocephalus argenteolus, *id. l. c.* p. 473, Colorado; *D. ferrarii*, Genoa, and *varioni*, Oran, p. xxiii., *reiberi*, p. xxiv., Haute-Alpes and Canton de Vaud, *bellevoysii*, p. xxv., Metz, A. Puton, Bull. Soc. Ent. Fr. (5) vii. : spp. nn.

Stegelytra putoni, sp. n., E. Mulsant & C. Rey, Ann. Soc. L. Lyon (n.s.) xxii. [for 1875, published in 1876], p. 186, Fréjus and Hyères.

Platymetopius chloroticus, Astracan, *apicalis*, Edough, near Bona, spp. nn., Puton, *l. c.* p. lxii.

Typhlocyba aureo-viridis, sp. n., Uhler, *l. c.* p. 474, Colorado.

FULGORIDÆ.

Aphana, sp. with Lepidopterous parasite (*Epipyrops*), and *Eurybrachis spinosa* with attached Lepidopterous larvæ; J. O. Westwood, Tr. E. Soc. 1877, pp. 433-435, pl. x. c.

Tettigometra. Notes on Italian species; F. Vismara, Bull. Ent. Ital. ix. pp. 217-219.

Fulgorina lebachensis, sp. n. (foss.), F. Goldenberg, Fauna Saræpontana fossilis, Heft ii. 1877, p. 38, pl. i. fig. 19, Carboniferous formation of Saarbrücken.

Hysteropterum maroccanum, L. Lethierry, Ann. Ent. Belg. xx. p. 46, Tangiers; *H. suturale*, p. 3, *germari*, p. 38, Portugal, *melanophleps*, p. 5, *impressum*, p. 31, *angulare*, p. 39, Spain, *phæophleps*, p. 6, Italy, *nervosum*, p. 11, *latifrons*, p. 22, S. Europe, *scoleogramma*, p. 13, *striolatum*, p. 32, Greece, *bilob[al]um*, p. 16, *fusco-venosum*, p. 29, S. France, *obsoletum*, p. 24, *cygnelis*, p. 27, Dalmatia, *montanum* (Beck., MS.), p. 25, *ergeneuse* [-nense] (Beck., MS.), p. 41, Sarepta, F. X. Fieber, R. Z. (3) v. : spp. nn.

Stiroma inconspicua, sp. n., Uhler, *l. c.* p. 458, Colorado.

PSYLLIDÆ.

C. G. THOMSON, Opusc. Ent. (fasc. viii.) pp. 820-841, describes the Scandinavian species, adopting *Chermes* for *Psylla*. A subgenus *Atenia* [-nius, Harold, Col. 1867] is characterized, p. 828, under *Chermes*, possibly an error for *Arytena*.

F. LÖW, Verh. z.-b. Wien, xxvii. pp. 123-154, pl. vi, makes synonymic and other observations on *Aphalara subpunctata*, Först., *A. picta*, Zett. (of which *A. flavipennis*, *sonchi*, and *innoxia*, F., and *A. alpigena*, M. D., are colour varr.), *Psylla lactea*, Costa, = *radiata*, F., *P. ulicis*, Curt., and *spartii*, Htg., = *genistæ*, Latr., *P. spartiophila*, F., = *spartii*, Guér. (with

which *P. torifrons*, Flor, ex typ., is not identical), figs. 1 a-c, *P. hippophaes*, Flor, fig. 3, *P. costato-punctata*, F., *P. saliceti*, F., figs. 4 a-b, *P. saliceti*, Flor, nec Forst., renamed *parvipennis*, p. 134, *P. mali*, Schmidberger (earlier than Förster), *P. pineti*, Flor, fig. 6, *P. apiophila*, F. (not *pyri*, L.), *P. fraxinicola*, Först. (with which *P. viridula* and *unicolor*, F., and *chlorogenes*, M. D., are identical), *Trioza sanguinosa*, F., = *albi-ventris*, F., *T. remota*, *cinnabarina* and *hamatodes*, F., and *dryobia*, Flor, = *remota*, F., *T. pinicola*, F., fig. 7, *T. acutipennis*, Zett, nec F., *T. crassinervis*, F., = *urtica*, L., and *T. proxima*, Flor.

Calinda, Blanch., = *Trioza*, Först., *Delina*, Blanch. [Desvoidy, *Diptera*, 1830], = *Rhinocola*, Först., and *Sphinia*, Blanch., = *Aphalara*, Först.; and errors in the descriptions in Gay's *Insects of Chili* by Blanchard are pointed out. V. Signoret, Bull. Soc. Ent. Fr. (5) vii. p. xxxvi.

Psylla visci, Curtis, redescribed from England; J. Scott, Ent. M. M. xiv. p. 94. *Psylla betulae*, L., and *Aphalara artemisiae*, Först., new to Britain; *id. op. cit.* xiii. p. 282. *Trioza juniperi*, Meyer, = *proxima*, Flor.; *id. l. c.* p. 283.

Trioza walkeri, Först., and *Chermes rhamni*, Schrk. Notes on these species, especially as to a possible confusion with regard to Schrank's insect; J. W. Douglas, Ent. M. M. xiii. p. 255. *C. rhamni*, Schrk., = *T. abieticola*, Först., larvæ; F. Löw, *op. cit.* xiv. p. 20. *Trioza centranthi*: notes on its economy and parasites; É. André, Feuil. Nat. viii. p. 9.

Trichopsylla, subg. n. of *Trioza*, with thorax hairy above; Thomson, *l. c.* p. 823. For *Trioza walkeri*, Först.

Psylla pulchella, p. 143, figs. 9 a-d, Asia Minor, *stenolabis*, p. 144, fig. 10 a-b, and *pyrastris*, p. 146, fig. 11 a-c, Vienna [Zool. Roc. xii. Ins. p. 144], *rhois*, p. 143, fig. 13 a-d, Austria, F. Löw, Verh. z.-b. Wien, xxvii. pl. vi., spp. nn.

Trioza tripunctata, p. 150, figs. 14 a-b, S. Tirol and S. France, *chrysanthemi*, p. 151, fig. 15 a-c, Switzerland, Löw, *l. c.* pl. vi.; *T. dalii*, Scott, Ent. M. M. xiv. p. 31, S. England; *T. obliqua*, p. 825, *hypoleuca*, p. 828, Thomson, *l. c.*, Sweden: spp. nn.

Chermes zetterstedti, p. 832, *lutea*, p. 833, *puncticosta*, p. 834, *annellata*, p. 836, *obliqua*, p. 837, *microptera*, p. 838, spp. nn., Thomson, *l. c.*, Sweden.

APHIDIDÆ.

Thirty species of various genera observed at Forró, Hungary, with the names of their food-plants; G. v. Horváth, Term. füzetek, 1877, pp. 234 & 235.

On the few species of which the sexes are known; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) vii. p. xxxii.

Aphis plantaginis, Schrank, stated by Kaltenbach to live in carrot roots, and with which *Forda dauci*, Goureaux (? = *Aphis dauci*, Fab.), is probably identical, discussed with reference to a descriptive paper by Graells, as affording an opportunity for deciding whether or not indefi-

nite parthenogenesis is possible. J. Lichtenstein, Bull. Soc. Ent. Fr. (5) vii. p. lii.

Note on alternate generation in *Pemphigus*, *Schizoneura*, and *Amycla*, the aerial forms producing agamous lice with rostrum, and the subterranean producing sexual young without rostrum; *id.* Ent. M. M. xiv. p. 117. Supplementary observations on generation in *Pemphigus*; F. Löw, Verh. z.-b. Wien, xxvii. (SB.) p. 40.

Lichtenstein, S. E. Z. xxxviii. pp. 71-75, pl., in "Weitere Beiträge zur Geschichte der Gattung 'Phylloxera,' Homoptera pupifera (Anthogenesis)," again enunciates his views on alternate generation. The terms "Androphora" and "Gynecophora," formerly employed by him, are now abandoned. Further observations on the Homoptera Anthogenetica; *id.* l. c. pp. 489-492.

Pemphigus boyeri suggested as the winged pupiferous form of *P. burarius*, *P. cærulescens* of *P. affinis*, *Amycla fuscicornis* of *Tetraneura ulmi*, and *Schizoneura venusta* of *S. corni*, with observations on anthogenetic species, and on sexuated young, both with and without rostrum, occurring in winter in aerial "species" (*Pemphigus spirotheca*, *Schizoneura corni*, and *Vacuna dryophila*); *id.* MT. schw. ent. Ges. v. pp. 300-303; Pet. Nouv. ii. p. 146.

Pemphigus. The subterranean winged species of this and allied genera are, like the winged *Phylloxera*, pupiferous forms producing sexuated insects; *id.* OR. lxxxiv. p. 1489. The existence of a sexual generation of *P. spirotheca*, Pass., without rostrum, stated; *id.* tom. cit. lxxxv. p. 1205.

Schizoneura and *Vacuna* added to the list of anthogenetic Aphidideæ (*Phylloxera*, *Pemphigus*, and *Tetraneura*), all of which have short antennæ. *Chintophorus aceris*, F., winged ♂ and ♀ coupling, and producing a sexuated apterous brood, which coupled eight days afterwards; *id.* Bull. Soc. Ent. Fr. (5) vii. pp. clxi. & clxii.

Schizoneura corni undergoes metamorphoses similar to those of *Pemphigus*, and migrates from roots of *Holcus* to leaves of *Cornus*; *id.* OR. lxxxv. p. 898. A note in Pet. Nouv. ii. p. 187, shows that Lichtenstein is anticipated by Leuckart and Huxley in 1858, and Derbès in 1869 and 1872, with regard to the reproduction of sexuated forms by subterranean species.

Schizoneura venusta, Pass., *S. corni*, F., *Pemphigus boyeri*, Pass., *Tychia trivialis* and *setariae*, Pass., and *T. sp. ?*, and *Amycla fuscifrons*, Koch (of which the winged stage was reared and found to be *Haploneura lentisci*, Pass.), from roots of cereals; *id.* Bull. Soc. Ent. Fr. (5) vii. pp. cviii. & ix.

Pemphigus boyeri, Pass. Notes on its injuries to maize-plants in Austria; F. Löw, Verh. z.-b. Wien, xxvii. (SB.) p. 37. Identified with *N. (Coccus) zea-maidis*, L. Duf., and a full account of its economy, synonymy, &c., given; *id.* l. c. pp. 799-806.

Lachnus. G. Canestrini & G. Fedrizzi, in an article entitled "La Manna dei Apicoltori," Atti Ist. Venet. (5) iii. (also separately, Venezia: 1877), consider the saccharine products of plants to be due to this *Aphis*. G. Ulivi, Bull. Ent. Ital. ix. pp. 232-235, considers it a true plant-

secretion. Cf. Targioni-Tozzetti, *l. c.* p. 240, on analysis of this sweet secretion and the possible influence of other *Homoptera* (*Typhlocyba*) in producing it.

Lachnus allegheniensis described and figured, in company with *Formica rufa*, Pennsylvania; H. C. McCook, Tr. Am. Ent. Soc. vi. pp. 274 & 275, fig. 8.

Phylloxera.

Observations on recent discoveries; A. Targioni-Tozzetti, Bull. Ent. Ital. ix. (Resoc. Adun.) pp. 1-6.

Review of memoirs by Targioni-Tozzetti and Balbiani, with explanatory observations; M. Girard, Pet. Nouv. ii. pp. 108 & 119.

Jullien-Crosnier: "Le Phylloxéra; étude sur la maladie de la vigne." Orléans: 1877, 8vo, pl.

In the Cognac district; E. A. Fitch, Ent. x. p. 44. In Dept. of Loir-et-Cher; Pelletier, Feuil. Nat. viii. p. 23.

Notes in CR [where not otherwise specified, on destructive agents or remedies] lxxxiv. :—Boiteau, pp. 21, 252, 1365, J. Maistre, p. 117, G. Fournet, p. 219, A. Rommier, p. 380, Report by Commission (Bouley & others), p. 428, Bouley, p. 537, P. Mouillefert, pp. 694, 1077, & 1367, F. Gueyraud, pp. 697 & 924, Azam, p. 755 (on spread in Dept. of La Gironde), V. Fatio, p. 918, M. Cornu, p. 921, Foëz, p. 922. In vol. lxxxv. :—Joffroy, p. 25, Mouillefert, p. 29, G. Guillaume, p. 212 (extension to Neuchâtel), H. Marès, p. 273, Laliman, p. 507 (an insect larva destroying *Phylloxera*: that of a *Syrphus*; Balbiani, *ibid.*), E. Prillieux, pp. 509 & 532 (extension to Vendôme), J. Duplessis, p. 532 (in Dept. Loir-et-Cher), H. Marès, p. 564 (on its spontaneous disappearance), Boiteau, p. 932 (the winter egg is always external), p. 1096 (development of eggs of *P. quercus* and *P. vastatrix*), Balbiani, p. 1203 (pointing out errors in preceding note), Duclaux, p. 1145 (summary of vineyards attacked in 1877), p. 1206 (progress in S. West France), A. Blankenhorn, p. 1147 (on the natural enemies), A. F. Marion, p. 1209.

Mouillefert's account of insecticides abstracted; Nature, xv. p. 200.

P. florentina and *P. signoreti*. A summary of recent observations; A. Tazzioni-Tozzetti, Bull. Ent. Ital. ix. pp. 236-239.

Colopha, g. n., J. Monell, Canad. Ent. ix. p. 102. Antennæ six-jointed, almost moniliform; front wing with three discoidal cells, the cubital once-branched, hind-wings with one oblique vein. For *Thelaxes ulmicola*, Walsh, = *Byrsocrypta ulmicola*, Fitch, not known in the winged state, and ? = *Pemphigus ulmicola*, Fitch.

COCCIDÆ.

Coccus covering roots of *Siforthis elegans*, with a wool-like waxy secretion; J. Künckel, Bull. Soc. Ent. Fr. (5) vii. p. cxxiii.

? *Aclerda subterranea*, Sign., from roots of cereals; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) vii. p. cviii.

Fonscolombia, g. n. For *Coccus radicum-graminis*, Fonsc., the "grass-

root mealy-bug," of which the male is apterous (? = *Coccus phalaridis*, Fab.); J. Lichtenstein, Ent. M. M. xiv. pp. 34 & 35; Bull. Soc. Ent. Fr. (5) vii. p. cviii.

Laboulbenia, g. n. For *L. brachypodii*, sp. n., found on *Brachypodium pinnatum*; id. MT. schw. ent. Ges. v. p. 229, ? = *Antonina purpurea*, Sign., id. l. c. p. 302. The larva found to undergo all its metamorphoses without any food.

"*Myzolecanium kibaræ*, Beccari (*Lecaniti*)" [apparently g. & sp. nn., but not so indicated], A. Targioni-Tozzetti, Bull. Ent. Ital. ix. p. 317, pl. vii. figs. 1-4, remarkable for its very long tubular labrum, found in a species of *Kibara* from New Guinea.

Eriopeltis lichtensteini, sp. n. (briefly indicated), V. Signoret, Bull. Soc. Ent. Fr. (5) vii. p. xxxvi. Hyères, Montpellier, and Holland.

(ANOPLURA.)

PEDICULIDÆ.

A. MURRAY, "Aptera" (*antea*, p. 2), pp. 384-400, gives the chief characters, with occasional reproduced woodcuts, of the species of *Hæmatomyzus*, *Hæmatopinus*, *Phthirus*, and *Pediculus*, of which specimens are contained in the Bethnal Green Branch Museum.

VERMES.

BY

F. JEFFREY BELL, B.A., F.Z.S.

CLASSIFICATION OF THE GROUP.

1. HAYEK, G. VON. Handbuch der Zoologie. Bd. I. Wien: 1877. *Vermes*, pp. 246-426, woodcuts.
2. HUXLEY, T. H. The Anatomy of Invertebrated Animals. London: 1877. *Vermes*, pp. 176-250; *Myzostomata*, pp. 627-629; *Enteropneusta*, pp. 629-631; *Chaetognatha*, pp. 632-636; *Nematoidea*, pp. 636-645; *Acanthocephala*, pp. 646-652; *Dicyemida*, pp. 652-655.
3. LANKESTER, E. RAY. Notes on Embryology and Classification. Q. J. Micr. Sci. xvii. pp. 399-455 (also separately).
4. SCHIMARDA, L. K. Zoologie. 2nd ed. Bd. I. Wien: 1877.

The present state of the classification of this group is well indicated in the terms with which HUXLEY (2) prefaces his remarks on the classification of what are here called *Vermes* (p. 671): "If there were no invertebrated animals beside those included under the four divisions of *Arthropoda*, *Mollusca*, *Zoophyta*, and *Protozoa*, the task of classification would be very easy, and each of the higher divisions would be sharply defined from the others. But a vast residuum remains to be considered, and it is with the attempt to arrange these residual orders into higher groups that the difficulties of the taxonomist commence." [These remarks offer a sufficient justification for the publication of the following detailed arrangements of Huxley, Schmarida, Ray Lankester, and Von Hayek.]

The *Annelida* contain the *Polychæta* and the *Oligochæta*, the *Hirudinea*, and the *Gephyrea*, which are united on account of the association of the following characters: (A) the segmentation of the body is at least indicated by the serially multi-ganglionic nervous centres; (B) the presence of cilia and of segmental organs; (C) and in the nature of the larvæ which are set free, when their embryos are hatched at an early stage of development. With the *Annelida* are ("though not without some hesitation") included the *Myzostomata*.

The *Trichoscolices* are intimately connected with the *Annelida* on the one hand, and on the other with the *Physemaria* and lower *Hydrozoa*. The water-vascular system, and the complication of the reproductive organs, indeed, afford clear marks of distinction. *Malacobdella* appears to unite the *Hirudinea* with the *Turbellaria* and *Trematoda*; *Polygordius* appears to be transitional between the *Turbellaria* and the *Polychæta*; while the *Rotifera*, in many respects, represent larval forms of the *Polychæta* and *Gephyrea*.

The *Nematoscolices* contain the *Nematoidea*, "which are as remarkable for the universal absence of cilia as the *Trichoscolices* are for their presence; and which are further so clearly distinguished by the arrangement of their nervous and muscular systems, and of their water-vessels, and by their ecdysis." With these are placed the *Nematorrhyncha*.

The *Chaetognatha* are regarded as an independent division.

The *Acanthocephala* (and *Cestoidea*) are, it is suggested, modifications of the *Mesozoic* type.

Of the six series into which the animal kingdom is arranged, the second (Annuloid) contains the *Trichoscolices* and the *Annelida*; the third (Arthrozoic), the *Nematoidea* and *Arthropoda* (and ? the *Chaetognatha*); the fourth (Malacozoic), the *Rotifera*, with the *Polyzoa* and *Mollusca*; the fifth (Pharyngopneustal), the *Enteropneusta* and *Tunicata*.

The *Vermes* are thus classified by VON HAYEK (1):—

- A. No ciliated circlet of tentacles, or dermal lobes at the anterior end of the body.
 - I. Body not segmented, or the segmentation not extending beyond the dermo-muscular tube.
 - α. Body flat 1. *Platyhelminthes*.
 - β. Body rounded.
 - i. Body divisible into head, trunk, and tail 3. *Chaetognatha*.
 - ii. No division of the body into head, trunk, and tail.
 - 1. No blood-vascular system 2. *Nematohelminthes*.
 - II. A blood-vascular system 4. *Gephyrea*.
 - II. Body segmented, and the segmentation extending to the internal organs 5. *Annelides*.
- B. A ciliated circlet of tentacles, or ciliated dermal lobes at the anterior end of the body 6. *Ciliata*.

The class *Platyhelminthes* are thus arranged in orders:—

- A. No enteric canal 1. *Cestoïdes*.
- B. An enteric canal.
 - i. Parasitic; surface of body not ciliated 2. *Trematodes*.
 - ii. Free-living; surface of body ciliated 3. *Turbellaria*.

The *Cestoïdes* are divided into seven families: 1, *Tæniidæ*; 2, *Bothriocephaliidæ*; 3, *Ligulidæ*; 4, *Tetrarrhynchidæ*; 5, *Tetraphyllidæ*; 6, *Diphylidæ*; 7, *Caryophyllidæ*.

The *Trematodes* are arranged in six families: 1, *Monostomidæ*; 2,

Amphistomidea; 3, *Distomidea*; 4, *Polystomidea*; 5, *Tristomidea*; 6, *Gyrodactylidea*.

The *Turbellaria* beside (A) *Dendrocœla*, and (B) *Rhabdocœla*, are made to include (C) *Nemertini*; and these sub-orders respectively include (A) six families—*Acerida*, *Pseudocerida*, *Prostherocera*, *Notocera*, *Carenota*, and *Planariida*; (B) five families—*Microstomida*, *Pharyngea*, *Apharyngea*, *Rhynchoproboli*, *Catenulida* (Schmarda); and for (C), McIntosh's families are given—*Cephalothricida*, *Carinellida*, *Lineida*, and *Amphiporida*.

The *Nematohelminthes* include three orders, with the following families:—

- | | |
|---------------------------------|--------------------------------|
| I. <i>Acanthocephali</i> . | |
| II. <i>Gordiacea</i> | 1. <i>Sphæularida</i> . |
| | 2. <i>Gordiida</i> . |
| | 3. <i>Mermithida</i> . |
| III. <i>Nematodes</i> | 1. <i>Urolabea</i> . |
| | 2. <i>Anguillulidea</i> . |
| | 3. <i>Hedruridea</i> . |
| | 4. <i>Physalopteridea</i> . |
| | 5. <i>Chiracanthidea</i> . |
| | 6. <i>Ascaridea</i> . |
| | 7. <i>Filaridea</i> . |
| | 8. <i>Cephalota</i> . |
| | 9. <i>Dacnidina</i> . |
| | 10. <i>Spiruridea</i> . |
| | 11. <i>Trichotrachelidea</i> . |
| | 12. <i>Strongylidea</i> . |

Appended to this class, as forms *incertæ sedis*, are *Cystoopsis acipenseris*, Wagn., *Echinoderes*, *Desmoscolex*, and *Chaetosoma*.

The *Gephyrea* are divided into three families: *Sipunculida*, *Priapulida*, and *Echiurida*.

The *Annelides* are thus set out:—

- | Sub-class. | Orders, | Families. |
|---------------------------------|----------------------------------|-----------------------------|
| I. <i>Discophori</i> | | 1. <i>Malacobdellea</i> . |
| | | 2. <i>Histiobdellea</i> . |
| | | 3. <i>Acanthobdellea</i> . |
| | | 4. <i>Clepsinea</i> . |
| | | 5. <i>Branchiobdellea</i> . |
| | | 6. <i>Hirudinea</i> . |
| II. <i>Chaetopoda</i> | I. <i>Oligochaeta</i> | 1. <i>Lumbricida</i> . |
| | | 2. <i>Phreoryctida</i> . |
| | A. <i>O. terricola</i> | 3. <i>Tubificida</i> . |
| | B. <i>O. limicola</i> | 4. <i>Enchytraeida</i> . |
| | | 5. <i>Naidea</i> . |
| | II. <i>Onychophora</i> .* | Sub-orders. |
| | III. <i>Polychæta</i> | 1. <i>Ectoparasita</i> . |
| | | 2. <i>Sedentaria</i> . |
| | | 3. <i>Nereida</i> . |

* Prof. Hayek seems to be in ignorance of Mr. Moseley's researches on *Peripatus*. Whatever are the exact relationships of *Peripatus*, there is now, and can be, no

The *Sedentaria* fall into fourteen families—1, *Capitellidæ*; 2, *Opheliidæ*; 3, *Telethysidæ*; 4, *Maldanidæ*; 5, *Ariciidæ*; 6, *Cirrhatulidæ*; 7, *Spionidæ*; 8, *Chaetopteridæ*; 9, *Sternaspidæ*; 10, *Pherusidæ*; 11, *Terebellidæ*; 12, *Amphictenidæ*; 13, *Hermellidæ*; 14, *Serpulidæ*: and the *Nereidæ* into—1, *Aphroditidæ*; 2, *Palmyridæ*; 3, *Amphinomidæ*; 4, *Eunicidæ*; 5, *Lycosidæ*; 6, *Nephtyidæ*; 7, *Glyceridæ*; 8, *Syllidæ*; 9, *Hesionidæ*; 10, *Phyllodocidæ*; 11, *Alciopidæ*; 12, *Tomopteridæ*.

Balanoglossus and *Polygordius* are placed as appendages to the *Annelides*.

The *Ciliata* are divided into the *Bryozoa* and *Rotatoria*, and the latter into six families—1, *Flosculariidæ*; 2, *Philodinidæ*; 3, *Brachionidæ*; 4, *Hydratidæ*; 5, *Asplanchnidæ*; and 6, *Albertidæ*.

LANKESTER (3) thus divides the *Platyhelminia* :—

Branch A. *Ciliata*.

- | | |
|----------------------|------------------------------|
| I. <i>Planaria</i> | . . . 1. <i>Rhabdocæla</i> . |
| | 2. <i>Dendrocæla</i> . |
| II. <i>Nemertina</i> | . . . 1. <i>Anopla</i> . |
| | 2. <i>Enopla</i> . |

Branch B. *Suctorina*.

- | | |
|-----------------------|----------------------------------|
| I. <i>Trematoidea</i> | . . . 1. <i>Monogenea</i> . |
| | 2. <i>Digenea</i> . |
| II. <i>Cestoidea</i> | . . . 1. <i>Caryophyllidea</i> . |
| | 2. <i>Tetraphyllidea</i> . |
| | 3. <i>Diphyllidea</i> . |
| | 4. <i>Pseudophyllidea</i> . |
| | 5. <i>Cyclophyllidea</i> . |
| III. <i>Hirudinea</i> | . . . 1. <i>Pericæla</i> . |
| | 2. <i>Bdellidea</i> . |

The *Gephyrea* into four classes—*Echiuridæ*, *Priapulidæ*, *Sipunculidæ*, and *Phoronidæ*.

The *Nematoidea* are divided into—1, *Ascaridæ*; 2, *Strongylidæ*; 3, *Trichinidæ*; 4, *Filariidæ*; 5, *Mermithidæ*; 6, *Gordiidæ*; 7, *Anguillulidæ*; 8, *Enoplidæ*; 9, *Chaetosomidæ*.

The *Platyhelminia*, *Gephyrea*, *Enteropneusta*, *Nematoidea*, *Chaetognatha*, and *Appendiculata* (in which are included the *Gnathopoda*) are regarded as separate "phyla." The *Solenogastres* form grade A (*Lipoglossa*), or *Scolecomorpha*, of the first branch (*Eucephala*) of the *Mollusca*.

The *Appendiculata* are divided into—

Branch A. *Chaetopoda*.

- | | |
|-----------------------|----------------------------|
| I. <i>Oligochaeta</i> | . . . 1. <i>Naidina</i> . |
| | 2. <i>Sænurina</i> . |
| | 3. <i>Lumbricina</i> . |
| II. <i>Polychæta</i> | . . . 1. <i>Vagantia</i> . |
| | 2. <i>Sedentaria</i> . |
| | 3. <i>Haliscoleina</i> . |

Appendix a *Myzostoma*.

Appendix b *Archisyllidea*.

doubt that they are with the Tracheate *Arthropoda* much more than with any other division of the animal kingdom.—F. J. B.

Branch B. *Rotifera*.

- Rotifera* . . . 1. *Arthroptera*.
 2. *Chaetoptera*.
 3. *Loricata*.
 4. *Tubicola*.
 5. *Bdelligrada*.

Appendix *Mutica*.

The following is SCHMARDA's classification (4) :—

I. TURBELLARIA.

Order 1. *Acœla*.

- " 2. *Dendrocœla*.
 Fam. 1, *Acerida*; 2, *Pseudocerida*; 3, *Prosthercerida*;
 4, *Notocerida*; 5, *Carenota*; 6, *Planariida*.
 " 3. *Rhabdocœla*.
 Fam. 1, *Microstomida*; 2, *Pharyngota*; 3, *Apharyngea*; 4, *Rhynchoproboli*; 5, *Catenulida*.
 App., *Dicyema*.
 " 4. *Nemertidea*.
 Fam. 1, *Holocephala*; 2, *Lobocephala*; 3, *Monorhæga*; 4, *Dirrhæga*; 5, *Tetrarrhæga*.
 App., *Balanoglossus*.

II. COTYLIDEA.

Order 1. *Cestoidæa*.

- Fam. 1, *Tæniida*; 2, *Dibothriida*; 3, *Diphyllida*; 4, *Tetraphyllida*; 5, *Ligulida*; 6, *Caryophyllida*.

" 2. *Trematoda*.Suborder α . *Digenea*.

- Fam. 1, *Monostomida*; 2, *Amphistomida*; 3, *Distomida*.

" β . *Digenea*.

- Fam. 1, *Tristomida*; 2, *Udonellida*;
 3, *Polystomida*; 4, *Octocotylida*;
 5, *Gyrodactylida*.
 App., *Myzostoma*.

" 3. *Hirudinea*.

- Fam. 1, *Malacobdellida*; 2, *Acanthobdellida*; 3, *Histiobdellida*; 4, *Branchiobdellida*; 5, *Clepsinida*; 6, *Hirudinida*.

III. NEMATHELMINTHES.

Order 1. *Acanthocephali*." 2. *Gordiacea*.

- Fam. 1, *Sphaerulida*; 2, *Gordiida*; 3, *Mermitida*.

" 3. *Chaetognathi*." 4. *Nematoidea*.

- Fam. 1, *Urolabæa*; 2, *Anguillulida*; 3, *Hedrerida*;
 4, *Physalopterida*; 5, *Chiracanthida*; 6, *Ascarida*; 7, *Filarida*; 8, *Cephalota*; 9, *Dacnidiida*;
 10, *Spirurida*; 11, *Trichotrachelida*; 12, *Strongylida*.
 App., *Cystoopsis*, *Desmoscolex*, *Rhabdophora*.

IV. ROTATORIA.

Order 1. *Holotrocha*.Fam. 1, *Ptygurida*; 2, *Æcistida*." 2. *Schizotrocha*.Fam. 1, *Megalotrochida*; 2, *Flosculariida*; 3, *Hydatiniida*; 4, *Euchlaniida*." 3. *Zygotrocha*.Fam. 1, *Phylodinida*; 2, *Brachionida*.App., *Trochosphaera*, *Perosotrocha*.

V. GEPHYREA.

Order 1. *G. inermia*.Fam. 1, *Sipunculida*; 2, *Aspidosiphonida*; 3, *Priapulida*." 2. *G. armata*.Fam. 1, *Echiurida*; 2, *Sternaspida*.App., *Chaetoderma*.

VI. CHÆTOPODA.

Order 1. *Abranchiata*.Fam. 1, *Ichthyiida*; 2, *Naiida*; 3, *Enchytraeida*; 4, *Tubificida*; 5, *Lumbricida*; 6, *Polyophtalmida*; 7, *Maldanida*; 8, *Chaetopterida*." 2. *Cephalobranchiata*.Fam. 1, *Pherusida*; 2, *Hermellida*; 3, *Terebellida*; 4, *Pectinariida*; 5, *Sabellida*; 6, *Serpulida*." 3. *Notobranchiata*.Fam. 1, *Thelethiida*; 2, *Opheliida*; 3, *Ariciida*; 4, *Cirratulida*; 5, *Neriniida*; 6, *Leucodorida*; 7, *Syllida*; 8, *Hesionida*; 9, *Phyllodocida*; 10, *Nephtyida*; 11, *Glycerida*; 12, *Nereida*; 13, *Lumbriconereida*; 14, *Eunicida*; 15, *Amphinomida*; 16, *Aphroditida*; 17, *Palmyrida*." 4. *Gymnocopa*.Fam., *Tomopterida*.App., *Polygordius*.

GEGENBAUR, in the second edition of his "Grundriss" (Engelmann), removes the *Tunicata* and *Onychophora* (*Peripatus*) from the *Vermes*, and forms a new division of *Solenogastres* for *Neomenia* and *Chaetoderma*. Pagenstecher (Allgem. Zoologie, pt. ii.) gives an account of the digestive system (pp. 54-96) and of the circulatory system (pp. 367-394) of *Vermes*.

PASCOE ("Zoological Classification": London) gives a list of the *Vermes* (pp. 36-50).

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NEW GENERA AND SPECIES, &c.

Linstow (11) describes the following *Cestoda*:—*Tænia ovolociniata*, pl. i. fig. 21, from *Hirundo urbica*; *T. cyclops*, pl. i. fig. 26, from *Coregonus marena* (not sexually mature); *T. macranthus*, pl. i. fig. 24, from *Anas clangula*.

He also (12) describes the following *Trematoda*:—*Diplostomum putorii*, pl. xiv. fig. 21, œsophagus and intestine of *Fætorius putorius*; *Tetracotyle soricis*, from *Sorex vulgaris*; *T. colubri*, pl. xiv. fig. 22, sub-integumentary tissue of *Coluber natrix* and *Vipera berus* (these two differ chiefly in their hosts); *T. ovata*, pl. xiv. fig. 24, found encysted in *Blicca bjoerkna*, *Osmerus eperlanus*, *Acernia cernua*, and *Abramis brama*; *Dactylogyrus malleus*, pl. xii. figs. 12 & 13, gills of *Barbus fluviatilis*; *Distomum eurystomum*, *D. ferruginosum*, pl. xiv. figs. 25–27, intestine of *Barbus fluviatilis*; and the following larval forms—*Monostomum viviparæ*, pl. xiii. fig. 16, from *Vivipara* (*Paludina*) *vera*; *Distomum phryganææ*, body cavity of *Phryganæa grandis*; *D. bufonis*, from *Bufo vulgaris*; *D. bliccæ*, in muscles of *Blicca bjoerkna*; *D. viviparæ-fasciatæ*, from *Vivipara* (*Paludina*) *fasciata*; *D. palemonis*, from *Palemon serratus*; *D. gammarî*, from *Gammarus pulex*; *D. viparæ*, from body-cavity of *Vipera berus*; *D. planorbis-cornei*, from *Planorbis corneus*. Also *Holostomum rotundatum*, sp. n., from the intestine of *Lanius collurio*.

Moseley (17) describes the following new genera and species of Land Planarians:—

Cenoplana. Body long and worm-like, much rounded on the back, flattened on the under surface, without an ambulacral line; external longitudinal muscular bundles largely and evenly developed over both dorsal and ventral regions; lateral organs as in *Rhynchodemus*; eyes absent from the front of the anterior extremity, but present in two lateral elongate crowded patches, placed just behind the anterior extremity and scattered sparsely on the lateral margins of the body for its entire extent; mouth nearly central, pharynx cylindrical. For *C. cærulea* and *sanguinea*, Paramatta, Sydney, *subviridis*, Camden and Paramatta, N.S.W.

Dolichoplana. Body extremely long and narrow, flattened, and band-like, tapering to a blunt point at either extremity; mouth situate at a distance from the anterior extremity of about one-third the length of the body; generative aperture at about the same distance posterior to it; eyes two only, as in *Rhynchodemus*; external longitudinal muscular bundles very much developed all over the body, but especially in the dorsal regions, where they are the only longitudinal muscles present; ambulacral line slightly indicated; lateral organs as in *Rhynchodemus*. For *D. striata*, near Manilla.

Geoplana flava, pl. xx. fig. 10, Bahia, Brazil; *G. traversi*, Wellington, New Zealand.

Rhynchodemus flavus, fig. 20, *R. fuscus*, fig. 19, Cape of Good Hope.

Bipalium unicolor, p. 286, Zamboanga, Mindanao, Philippines.

Stylochus pelagicus, Moseley (16), pp. 23-27, pl. iii. figs. 9-13. Eight pelagic Planarians are now known.

Dibothrium ligula. Under this name, Donnadien, J. de l'Anat. Phys. xiii. pp. 321-370, 451-497, pls. xiv.-xx., unites all the species which have been described as *Ligula*.

Distoma sinense figured and partly described; W. Macgregor, Glasg. Med. Journ. 1877, pp. 1-15; appendix by T. S. Cobbold.

Mesostomum morgiense, Du Plessis (8), pp. 259-278, pl. v.

Mesodiscus inversiporus, Trieste, closely allied to *Prosthiostrum*, Ulianin, and *Opisthoporus tergestinus*, allied to *Leptoplana*; Minot (13).

Plagiostomum caspium, p. 85; *Polycelis schulmani*, p. 87, pl. iii. figs. 2 & 3; *Clepsine cæcum*, p. 95, gg. & spp. nn., Trieste; Gromma (Aralo-Caspian Exp.).

Arhyncotania critica (cyst on liver of *Hyrae capensis*), Pagenstecher (20).

Monostoma (*Glenocercaria*) *lucanica*, p. 200, *Distoma* (*Gymnocephala*) *ascoidea*, p. 201, (these two in liver and intestine of *Planorbis*) [the latter is described as a free *Cercaria*, "agreeing with the description of *C. minuta*, Nitzsch, which is found with various fresh-water mollusks in Europe!"], *D. appendiculata* (from *Helix arborea*), p. 202; J. Leidy, P. Ac. Philad. 1877.

Tenia insignis, from the digestive canal of *Carpophaga oceanica*, Lesson; Steudener (22).

Staphylocystis bilarius, Villot (23). The name *Staphylocytes* is proposed for those larval forms of *Cestoda* in which gemmation is external and not internal; found in *Glomeris limbatus*, Latr. *S. microcanthus*, id. (24), pp. 352 & 353.

No names or descriptions, save "little," "white," "black, with small tubercles," are to be found in J. D. Macdonald's paper on a new genus of *Trematoda*, and some new or little-known parasitic *Hirudinea*, Tr. L. S. (2) i. pp. 209-213, pl. xxxiv.; as an apology, the writer states that the paper was written without any opportunity of consulting recent researches on the subject.

Linstow records the presence of the following forms in higher animals or new localities, or gives a description of them:—

Distomum planorbis-carinati, Philippi, Lake Ratzeburg; *D. macrophallus*, Linstow (in *Totanus fuscus*); *D. spinulosum*, Rud., xiii. fig. 14, Lake Ratzeburg; *D. baculus*, Dies., xiii. 15.

Dactylogyrus dujardinianus, Dies., is a doubtful species.

Holostomum sphaerula, Duj.; *H. cornu*, Nitzsch; *H. variabile*, Nitzsch; *H. gracile*, Duj., xii. 17; *H. erraticum*, xii. 18 & 19; *H. cornucopiae*, xii. 20, 29 & 30.

Tetracotyle perca-fluviatilis, Moulinié, xiv. fig. 23; *T. typica*, Dies., pt. (= *T. lymanai*, Pagenstecher), this form is only found in *Mollusca* (and not in fishes or birds, as Diesing's species would make it); *T. crystallina*, Rud. (= *Distomum crystallinum*, Rud., pt., = *D. crystallinum*, Pagenstecher).

Dendrocoelum lacteum, *Vortex lemani*, and a species of *Ligula* are recorded from the depths of the Lake of Geneva; Bull. Soc. Vaud. xiv. pp. 203 & 204.

Plagiostenia gigantea, Peters, in the rhinoceros of the Sunderbunds, the third species of rhinoceros in which this form has been found; Garrod, P. Z. S. 1877, pp. 788 & 789.

Barrois (5), p. 30, points out that the species *Lineus sanguineus* and *L. gesserensis* are allied by a number of intermediate forms, and adopts, for the two, Desor's name *obscurus* (the young of the first year are said to be not so strongly pigmented). As McIntosh has united in his *Amphiporus spectabilis* the two forms *Cerebratulus spectabilis*, Quat., and *Borlasia splendida*, Keferst., which have nothing in common save their coloration (alternating white and violet bands), and as there is already a *Drepanophorus spectabilis*, Barrois proposes to return to Keferstein's specific name of *splendidus* for the *Amphiporus* so common at Roscoff.

ANATOMY, DEVELOPMENT, &c.

Barrois (5), in an elaborate memoir, details the history of *Lineus obscurus* (pp. 30-97, pls. i., iv., vii., ix., & xi. fig. 156), *Amphiporus lactiflorus* (pp. 100-137, pls. v., vi., vii., & x.), *A. splendidus* (pp. 137-140, pl. ix.), and *Tetrastemma candidum* (pp. 140 & 141, pl. vii.). There is an account, also, of the regeneration of the head in *Lineus obscurus*, and of *Tetrastemma dorsale* (pp. 154-160, pl. vii.), *Polia carcinophila* (pp. 160-165, pl. vii.), and *Cephalothrix linearis* (pp. 165-167, pl. vii.). The memoir concludes with some general considerations on the structure and evolution of these forms. Of points of most importance—the gastrula is formed by invagination; its orifice (blastopore) becomes completely closed up; the prostomium is indicated very early; the true ectoderm disappears during development; and the epithelial layer of the adult is of mesodermal origin.

Minot (13) investigates the anatomy of the *Dendrocoela*, and proposes the following classification:—ACCELA: *Nadina*, *Convoluta*, *Schizoprorca*. APHARYNGEA: *Macrostomum*, *Vera*. PHARYNGOCCELA: *Rhabdocœla*—*Rhabdocœla* (auct. pt.); *Dendrocoela*. VAGINIFERÆ: *Trematoda*, *Cestoda*. In (14) he gives a sketch of what is known as to these forms, based on the investigations of others, as well as on his own.

Hoffmann (9) agrees with Semper in regarding *Malacobdella* as a Nemertine, and not a Leech; its only point of agreement with the *Hirudinea* is the possession of a posterior sucker. His specimens were found in the gills of *Pholas crispata* (never in *P. candida*), and were found to be sexually mature from November to March.

Steuender (22) describes the structure of the cuticle, water-vascular system, and nervous system of the Cestodes; the generative organs of *Tenia elliptica*, Batsch, and of *Tricnophorus nodulosus*, Rud.; and the structure of *Tenia tripunctata*, Braun.

Redon's (21) experiments will, if confirmed, be of value as affording an exception to the law that parasites undergoing alternation of generation cannot attain their complete development in the same individual or

species. Cysticeri from a human corpse were swallowed by Redon, pigs, and dogs; it was in Redon only that the strobila stage was developed. Lortet is of opinion that the form obtained was no other than *Tania solium*.

Pagenstecher (20) has observed the presence of nine examples of *Arhyncotania critica* (sp. n.) in the strobila stage, in a cyst found on the liver of *Hyrax capensis*, Schreber. In elucidation of the attainment of sexual maturity prior to ingress into the intestine, the author cites the history of *Cysticercus fasciolaris* from the liver of the mouse, and the condition attained by *Tania crassicolis* in the cat, and other *Felidæ*. In a cyst in the neck of *Myopotamus coypus*, Geoffroy, Redon found a *Cœnurus serialis*, Gervais, with two rows of sixteen hooks, one smaller than the other, and both smaller than those of *C. cerebralis*; and he concludes that this is the same species as that found by Cobbold in *Lemur macaco* and *Sciurus* sp. (American), and by others in the hare.

G. J. Romanes writes (Nature, xv. p. 275) on tape-worm in rabbits.

G. Zograf is reported by Hoyer (in Protocoll der Sitz. der Section für Zool., Versamml. russischer Naturforscher, &c., Z. wiss. Zool. xxviii. pp. 393-396) as describing the structure of *Trienophorus nodulosus*. The longitudinal muscles of the neck are divided into four bundles; the cuticle is villous; no shell-gland.

Du Plessis (8) describes a new *Mesostomum*, with large and well-developed auditory capsules, not hitherto known in this genus. In a second note, "Sur le *Vortex lemani*" (tom. cit. pp. 254-259), he states his disagreement with Graff's [Zool. Rec. xii. p. 634] opinion as to this form belonging to the genus *Planaria*, but he leaves Graff to find a new generic name; in his own opinion it is intermediate between the *Rhabdocœla* and *Dendrocœla*.

The second edition of Davaine (7) contains 110 for the 88 figures of the first edition (1860), and a supplement, in which are given details to bring the subject up to the present state of science.

Landois (10) gives an interesting account of a visit to a leech farm.

The structure of *Geoplana traversi*, and of the Australian new species, and of *Dolichoplana striata* is described by Moseley (17) in some detail. *Limacopsis*, Diesing (with eye-bearing frontal tentacles), probably differs much from the *Geoplanide*, which appear to form a natural family. The New Zealand forms seem to be most closely allied to the South American, and the Cape species to the Indian land-Planarians. The ova are found in chitinous capsules, and develop in them into free embryos; cf. *Dendrocœlum lacteum*.

Linstow (12) is led to the conclusion that *Tetracotyle* and *Diplostomum* are larval forms of *Holostomum*; he traces the life-history of *H. cornucopiæ*, the mode of which is shown to be intermediate between that of *Distomum*, *Monostomum*, and *Amphistomum*, in which sporocysts are developed, and *Gyrodactylus*, *Diplozoon*, *Polystomum*, &c., in which the embryos resemble the mother.

Donnadieu (*suprà*, p. 9) has examined the development of *Ligula*, and finds that the ovum is developed in water, and that the scolex passes into the digestive tract of fishes (chiefly Cyprinoids), thence reaching the peri-

toneal cavity, from which it has to escape, and enter the intestine of aquatic birds to develop proglottids.

Villot (25) finds that *Glomeris* is the nurse for the tœniæ of the shrews, and that they are in that host in the "staphylocystic" stage; *T. scutigera* was found in *Sorex tetragonurus*; *T. scalaris*, *T. tiara*, and *T. pistillum* in *S. araneus*.

T. S. Cobbold describes and figures the large equine fluke which he now calls *Gastrodiscus sansinoi* (= *Diplostomum ægyptiacum*, T. S. C.), in Veter. 1877, pp. 234-239; this species has an enormous sucker on its ventral surface, within which are 200 smaller suckers.

The following papers also deal with this group:—Duchamp, Sur les conditions de développement des Ligules; C. R. lxxxv. pp. 1239 & 1240. Moniez, Sur l'embryogénie des Cestoides; tom. cit. pp. 974-976. Macleay, Notes on the Entozoa of a Sun-Fish; P. Linn. Soc. N. S. W. 1877, pp. 12 & 13. Sansino, On the Entozoa of the Horse; Veter. 1877, pp. 49-54, 121-128. De Saint Joseph, Note sur l'armature de la *Ptychodes splendida*, Dies (*Cerabratulus spectabilis*, Quat.); Bull. Soc. Philom. 1876-77, pp. 148-151. Vaillant, Remarques sur une figure de l'appareil stylière des Némertiens donnée dans les planches du "Voyages en Scandinavie, &c." (Gaimard), tom. cit. pp. 132 & 133. Perroncito, Tenacity of Life in Helminthes; Veter. 1877, pp. 457-461. H. Saake, Die Wurmtuberkeln im submucösen Bindegewebe des Dunndarmes der Rinder; Arch. f. Thierh. 1877, pp. 195-200, 467 & 468, pl. iii. 3 & 4.

Balert, Die Bandwürmer und die übrigen Eingeweidewürmer des Menschen, &c. (Leipzig: R. Holm), and Vogt, Die Herkunft der Eingeweidewürmer (Basel: Georg), have not been seen by the Recorder.

NEMATHELMINTHES.

26. BRANDT, A. Ueber die Eifurchung der *Ascaris nigro-venosa*. Z. wiss. Zool. xxviii. pp. 365-384, pls. xx. & xxi.
27. CLAUS, C. Ueber die Trichine. Wien: 1877.
28. GHALEB, O. Sur l'anatomie et les migrations des Oxyuridés, parasites des Insectes du genre *Blatta*. C. R. lxxxv. pp. 236-239.
29. HALLEZ, —. Sur le développement de l'*Anguillula aceti*, Erh. Rev. Sci. Nat. v. pp. 454-466.
30. SOLGER, B. Ueber eine neue Species von *Trichosoma*, R. Arch. f. Nat. xliii. pp. 19-24, pl. ii.
31. STIRLING, W. On the changes produced in the lungs by the embryos of *Ollulanus tricuspis*. Q. J. Micr. Sci. xvii. pp. 145-152, pl. xi.

NEW GENERA AND SPECIES, &c.

Linstow (11) describes the following new forms:—*Mitrephoros hemisphaericus*, g. & sp. nn., p. 2, pl. i. fig. 2, *Acrobeles ciliatus*, g. & sp. nn., *ibid.*, pl. i. fig. 3, both from Lake Ratzeburg; only forms which were sexually immature were observed, but in both cases the characters of the head

were quite new. *Tylenchus pillulifer*, pl. i. fig. 1; the first species of this genus found to be aquatic. These three were free-living. The following parasitic: *Trichosoma papillifer*, sp. n. (intestine of *Hirundo urbica*), pl. i. fig. 11, possibly identical with that found in *H. rustica*, but this latter has never been described, and has no specific name. *Filaria tridentata*, sp. n. (*Colymbus arcticus*), pl. i. fig. 17, male pl. xii. fig. 7; a similar tridentate tooth has been observed in *F. laticeps* (Schneider). *F. tuberculata* (= *Spiroptera alternata*, auct.); found in *Hirundo urbica*, pl. i. fig. 18. *F. hamata* (in *Falco nisus*), pl. i. fig. 19. *Agamonematodum tritonis* (Polymyarian) found as a larval form in intestine of *Triton taniatus*. *A. geotrupis*, body cavity, and especially fatty bodies of *Geotrupes stercorarius*, pl. i. fig. 20; and in (12) *Filaria turdi* (in *Turdus iliacus*), sexually immature Polymyarian, pl. xii. fig. 3. *F. strigis* (= *Trichina affinis*, Wedl., pt.), pl. xiv. fig. 28. *Trichosoma pachyderma* (œsophagus of *Podiceps minor*). *T. breve* (intestine of *Totanus fuscus*) females only. *Ascaris vimbae* (intestine and liver of *Abramis vimba*), pl. xii. fig. 8.

Monohystera bulbosa, sp. n., Gromma, in the Aralo-Caspian Expedition, p. 102, pl. iv. fig. 6.

Trichosoma recurvum, Solger (30), from a young crocodile (? *C. acutus*), said to come from Mexico; females only observed.

Oxyuris kuenckeli, found in *Blatta americana*, and *O. blatticola*, from *B. germanica*, *B. laponica*, and *B. livida*, Ghaleb (28).

The following forms are also described by Linstow (11):—*Gordius aquaticus*, Grube, in which he finds five layers in the integument, whereas Meissner only noted three; he has also discovered in *Limnaeus vulgaris* the encapsuled embryos of this species, pl. i. figs. 4–6. *Tropidocera paradoxa*, Diesing, pl. i. figs. 7 & 8. *Strongylus patens*, Duj., pl. i. figs. 9 & 10; Linstow finds two, and not, with Dujardin, one papilla anterior to the tail in the female. *Oxyuris blattæ-orientalis*, Hammerschmidt, pl. i. fig. 12. *Physaloptera alata*, R., pl. i. figs. 13–15; some omissions from Schneider's observations are supplied. *Filaria leptoptera*, Rud. (this species does not belong to *Spiroptera*), pl. i. fig. 16. *Filaria obvelata*, Creplin (= *Cosmocephalus alatus*, Molin, = *Histiocephalus spiralis*, Diesing), pl. xii. figs. 4–6. *Trichosoma contortum*, Creplin, *T. resectum*, Duj. (the bands of spines are, in age, replaced by three dark distinct longitudinal bands), *T. obtusum*, Rud., *Dispharagus denudatus*, Duj., and *Cucullus pachystomus*, Linstow, appear to be identical. *Oxyroma brevicaudatum*, Zed. (= *Heterachis brevicaudata*, Duj.), pl. xii. fig. 9. *Nematozys commutatus*, Rud. (= *Ascaris acuminata*, auct., pt., and *A. brevicaudata*, auct., pt.). The difference stated by Schneider to exist between the muscle cells of *N. commutatus* and *N. ornatus* does not obtain (pl. xii. fig. 10). *N. ornatus*, Duj. (= *Oxyuris ornata*, Duj., and *O. ornata*, Walter), pl. xii. fig. 11.

ANATOMY AND PHYSIOLOGY.

Brandt (26) points out that the germinal vesicle varies greatly in form in consequence of its amœboid movements, and that this may lead to its

apparent disappearance. He concludes that, first, the germinal vesicle of the Nematoid egg is not broken up or otherwise destroyed; secondly, the "two new nuclei" are descended from the vesicle; and thirdly, the appearance of these two new nuclei, or of more, is apparently due to the concentration of the substance of the germinal vesicle, previously scattered by its amoeboid movements.

Galeb & Pourquier, "Sur la *Filaria hæmatica*," C. R. lxxxiv. pp. 271-273, J. Zool. vi. pp. 127-129, Ann. N. H. (4) xix. p. 352, make the remarkable statement that *Filaria* are only found in embryos when there are adult forms in the cavities of the maternal heart.

The following papers also deal with Nematohelminths:—Bavay, Sur l'Anguillule intestinale (*A. intestinalis*), trouvé par le Dr. Normand chez les malades atteints de diarrhée de Cochinchine; C. R. lxxxiv. pp. 266-268, J. Zool. vi. pp. 16-20, pl. i., Ann. N. H. (4) xx. p. 350. Lewis, *Filaria sanguinis-hominis*, mature form, Lancet, ii. p. 453, with figures, CB. med. Wiss. 1877, p. 770. T. S. Cobbold, Adult representatives of microscopic *Filaria* (*F. bancrofti*), Lancet, p. 70; on *F. bancrofti*, tom. cit. p. 495, with fig. Tikhoniroff, Notice sur un procédé nouveau facile et sûr de trouver trichines dans la chair suspectée; Bull. Mosc. lii. pt. i. pp. 153-159. Ganin described the development of *Pelodera teres* to the Russian Naturalists (Hoyer, pp. 412 & 413), and discussed Natanson's investigations into the development of *Oxyuris brachyura*, *O. blattæ*, and *O. diesingi*, pp. 413 & 414. Manson, P., On Chinese *Hæmatozoa*, Med. Times & Gaz., 1877, *Filaria immitis*, p. 514, *F. sanguinolenta*, p. 538, *F. sanguinis-hominis*, p. 562. Ercolani, Osservazioni sulla vita libera dell' *Ascaris maculosa*, Rud. (Mém. Ac. Bolog.); this last and the papers of Claus and Hallez have not been seen by the Recorder.

A large Nematoid (? *Enoplus*) was taken in the depths of the Lake of Geneva; Bull. Soc. Vaud. xiv. p. 203.

CHÆTOGNATHA.

Hertwig (47) describes the fusion of the spermatic and ovarian nuclei in *Sagitta*, p. 277; and Moseley (15) describes the colouring of several species.

ENTEROPNEUSTI.

32. SPENGLER, J. W. Ueber den Bau und die Entwicklung des *Balanoglossus*. Ber. Vers. Natur. l., München, p. 176.

There are no lateral vessels and no pore at the tip of the proboscis; the observations of Metschnikoff and Agassiz on the formation of the gills are confirmed. The proboscis does not seem to be comparable with that of the *Nemertines*, or the gill-slits with those of the *Tunicata*.

ROTATORIA.

33. BARROIS, J. L'embryogenie du genre *Pédalion*. Ass. Française (Rev. Sci. xiii. p. 303).

[Not seen by the Recorder.]

34. BATSCI, S. Rotatoria Hungariæ. A Sodrő-állatkák és Magyarországbán Megfigyelt Fajaik. Budapest: 1877, 4to, pp. 52, pls. i.-iv.

This treatise, written in Magyar, and published by the Hungarian Academy of Sciences, discusses the structure and affinities of the Hungarian species, accompanied by 47 figures of the more salient forms, with anatomical detail. Five genera of *Flosculariina*, 4 of *Philodinæa*, 7 of *Hydatinæa*, 8 of *Longisetæ*, 3 of *Scaridina*, and 12 of *Loricata*, are particularized (*Notommata*, Ehr., being renamed *Monommata*, p. 36). The following species are described as new:—*Floscularia longilobata*, pp. 24 & 52, pl. ii. fig. 14; *Rotifer maximus* and *R. motacilla*, pl. iv. fig. 34, pp. 27 & 52; *Ascomorpha saltans*, pp. 42 & 52, pl. ii. fig. 17 (also in Würtemberg); *Euchlanis pannonica*, pp. 45 & 52, pl. iii. fig. 28; and *Brachionus minimus*, pp. 49 & 52, pl. i. figs. 7 & 8.

35. BEDWELL, F. A. On the Building Apparatus of *Meliceria ringens*. M. Micr. J. xviii. pp. 214–223, pls. cxvii. & cxviii.

36. DU PLESSIS, G. Note sur l'*Hydatina senta*. Bull. Soc. Vaud. xiv. pp. 167–176.

Rotifer vulgaris. On its reproduction; C. F. Cox, M. Micr. J. xvii. p. 301.

GEPHYREA.

37. GREEFF, R. Ueber den Bau und die Entwicklung der Echiuren. Arch. f. Nat. xliii. pp. 343–353; SB. Ges. Marb. No. 4, p. 18.

38. KOREN, J., & DANIELSEN, D. C. Fauna littoralis Norvegiæ. Contribution to the Natural History of the Norwegian *Gephyrea*, pp. 111–155, with plates.

Greeff (37) describes the structure of the dermo-muscular tube and subjacent muscles, the central nervous and blood-vascular systems (the latter is open to the cœlom at the tip of the proboscis); and the generative organs, the number of which is not constant. The ova of *Bonellia viridis* appear to escape into the cœlom. The statement of Kowalewsky that *Turbellaria*-like forms of the male sex only are to be found in the uterus of the females of *B. viridis* is confirmed (as yet only females of this species had been observed), but he considers that further observations are required. The results of Schmarda on development are disputed, while those of Salensky are, in part, confirmed; the author's own observations on *Echiurus pallasi* have not been very successful. The author does not think that either the history of development, or the details of adult structure, point to any relationship between the *Echiuri* and *Echinoderma*, and he is of opinion that the tubes with ciliated infundibula resemble more closely the "segmental organs" of Annelids than the "lungs" of the *Holothuroidea*.

Ludwig, Z. ges. Naturw. I. pp. 493–494, describes briefly and figures the spectrum of the colouring matter of *Bonellia viridis*, in which he finds five absorption bands.

Koren & Danielssen (38) give an account of their anatomico-histological investigations on the *Sipunculidae*, especially *Sipunculus priapuloides*, pl. xiii. figs. 1-6; *Phascolosoma loveni*, pl. xiv. figs. 17-21; *P. squamatum*, pls. xiii. fig. 11, xiv. figs. 14 & 15; *P. abyssorum*, pl. xiv. figs. 25-27; *P. pallidum*, pl. xiv. figs. 22-24. They describe as new:—

Onchnesoma. Body small and pear-shaped, proboscis long, anal aperture a little in front of the base of the proboscis; no tentacles or vascular system, one retractor. *O. steenstrupi*, pl. xv. figs. 28-36; *O. sarsi*, pl. xv. figs. 37-40.

Tylosoma. Body cylindrical, densely covered with papillæ, anterior part truncated, broad, scutiform, having in the centre a small prominent round mouth; no proboscis, no tentacles, no vascular system. *T. lutkeni*, pls. xiii. figs. 12, 13 A, B, & C, xiv. fig. 16.

Priapuloides. Anterior part of body forms the proboscis; mouth with teeth; anal aperture in posterior extremity, and on each side of it a long cylindrical appendage (? gill) covered with vesicles; the genital pores below, and on the sides of the anus. *P. typicus*, pl. xvi. figs. 10-14.

The following forms are also described:—*Echiurus* (*Thalassema vulgaris*, Savigny; *E. lutkeni*, ? Dies; *Bonellia viridis*, Rolando; *Phascolosoma eremita*, Sars; *Phascoloma* (*Sipunculus*) *margaritaceum*, Sars; *P. harveyi*, Forbes; *P. (S.) papillosum*, Thomps.; *P. (S.) vulgare*, Blainville; and *P. (S.) strombi*, Montagu.

ANNULATA.

39. BARROIS, J. Sur quelques points de l'embryologie des Annélides. C. R. lxxxv. pp. 297-299.
40. BÜTSCHLI, O. Entwicklungsgeschichtliche Beiträge iii. Zur Kenntniss des Furchungs-processes und der Keimblätterbildung bei *Nephele vulgaris*, Moquin Tandon. Z. wiss. Zool. xxix. pp. 239-252, pl. xviii.
41. DUNS, J. On an unnamed Palæozoic *Annelid*. P. R. Soc. Edinb. 1876-77, pp. 352-359, pl. iv.
42. GREEFF, R. Untersuchungen über Alciopiden. Nov. Acta L.-C. Ak. Naturf. xxxix. pp. 33-132, pls. ii.-vii.
43. GRINNELL, G. B. Notice of a New Genus of Annelids from the Lower Silurian. Am. J. Sci. (3) xiv. p. 229.
44. GRUBE, E. Anneliden-Ausbeute S.M.S. Gazelle. MB. Ak. Berl. 1877, pp. 509-554.
45. HARTING, J. E. On the occurrence in England of Dutrochet's Land Leech (*Trochetia subviridis*). Zool. (3) i. pp. 515-523.
46. HATSCHEK, B. Beiträge zur Entwicklungsgeschichte und Morphologie der Anneliden. SB. Ak. Wien, lxxiii. [1876] pp. 443-461, pl. i.
47. HENSEN, V. Die Thätigkeit des Regenwurms (*Lumbricus terrestris*, L.) für die Fruchtbarkeit des Erdbodens. Z. wiss. Zool. xxviii. pp. 354-364.

48. HERTWIG, O. Beiträge zur Kenntniss der Bildung, Befruchtung, und Theilung des thierischen Eies. 2^{or} Theil. 1. Die ersten Entwicklungsvorgänge im Ei der Hirudineen (*Hæmopsis* and *Nepheleis*). Morphol. JB. iii. pp. 2-32, 53-83, pls. i.-iii.
49. HOFFMANN, C. K. Zur Entwicklungsgeschichte der *Clepsinen*. Niederl. Arch. Zool. iv. pp. 31-55, pls. iii. & iv.
50. LANGERHANS, P. Ueber *Acicularia virchowii*, eine neue Annelidenform. MB. Ak. Berl. 1877, pp. 727 & 728, pl.
51. MCINTOSH, W. C. Note on a New Example of the *Phyllodocidae* (*Anaitis rosea*). J. L. S. xiii. pp. 215 & 216.
52. —. On the arrangement and relations of the great nerve-cords in the Marine Annelids. P. R. Soc. Edinb. 1876-77, pp. 372-381, (abstract).
53. On the structure of *Magelona*. P. R. Soc. xxv. pp. 559-564 (abstract). Ann. N. H. (4) xx. pp. 147-152.
54. PERRIER, E. Les Vers de terre du Brésil. Bull. Soc. Z. Fr. ii. pp. 241-247.
55. SEMPER, C. Beiträge zur Biologie der Oligochæten. Arb. Inst. Würzb. iv. pp. 65-112, pls. iii. & iv.
56. TURNBULL, F. M. On the Anatomy and Habits of *Nereis* (*Alitta*) *virens*. Tr. Conn. Ac. iii. pp. 265-281, pls. xlii.-xliv. [Aug. 1876.]
57. VEJDovsky, F. Zur Anatomie und Systematik der Enchytreiden. SB. böhm. Ges.

[Preliminary notice ; not seen by the Recorder.]

NEW GENERA AND SPECIES, &c.

Grube (44) describes the following new forms:—*Lætmonice producta*, *Polynoe vesiculosa*, *P. fullo*, *P. pycnolepis*, *Panthalis bicolor*, *Sthenelais incisa*, *Sigalion amboinensis*, *Psammolyce umbonifera*, *Nereis* (*Ceratonereis*) *divaricata*, *Vanadis greeffiana*, *Syllis buchholziana*, *Hyalinaccia platybranchis*, *H. brevicirris*, *Eunice complanata*, *E. dilatata*, *Lumbriconereis amboinensis*, *Goniada congoensis*, *Nephtys trissophyllus*, *N. modesta*, *N. dibranchis*, *Cirratulus atro-collaris*, *Spiochaetopterus tropicus*, *Maldane decorata*, *Trophonia kerguelarum*, *Terebella* (*Loimia*) *ochracea*, *T. (Phryzelia) bilobata*, *Sabella costulata*, *S. torquata*, *Serpula patagonica*, *Lumbricus kerguelarum*, *L. tongaensis*, *Perichæta subquadrangula*.

The new genera are:—*Lamproderma* (*Hesionidae*), p. 525 ; *L. longicirre*, New Britain. *Pycnoderma* (*Chlorhamini*), p. 540 ; *P. congoense*, Congo. *Phyllocomus* (*Ampharetei*), p. 543 ; *P. crocea* (between the Crozets and Kerguelen).

Thelepus, Leuck. (char. emend., Mgn.), and *Neottis*, Mgn., are united on the ground that the possession of one more branchiferous segment by the latter does not justify their separation; and, as there is a *T. antarctica*, Kinberg, the *N. antarctica* of McIntosh must have a new specific name, and Grube suggests *m[a]cintoshi*.

Nereidavus varians, g. & sp. nn., Grinnell (43), from the jaws only, which resemble those of *Nereis pelagica*, Linn.

Cymaderma, g. n., Duns (41), "strim tenues in ordinem undulatæ, et ubique corpus cingentes, ita ut cutis subrugosa videatur." Upper carboniferous strata near Settle, Yorkshire.

Semper (55) describes two new species—*Dero rodriguezi*, pp. 106 & 107, pl. iv. figs. 15 & 16, and *D. philippinensis*, p. 107.

Langerhans's (50) new form was found in the Bay of Funchal; it is a free-living Chætopod, with its nearest allies among the *Phyllodoceide*; it agrees with *Tomopteris* in having the setæ reduced to supporting aciculi, but there are no setæ on the first segment, and the head has no appendages whatever.

Greeff's (42) species were mentioned, but not described in his "Auge der Alciopiden" [Zool. Rec. xiii.] :—*Alciopæ cirrata*, p. 60, pl. i. figs. 5 & 6, pl. ii. figs. 19–21; *Vanadis ornata*, p. 66, pl. iii. figs. 29–32; *V. pelagica*, p. 67, pl. iii. figs. 33 & 34; *V. crystallina*, p. 68, pl. iii. figs. 35–39; *Nau-phanta*, g. n. [Zool. Rec. xiii.]; *N. celox*, p. 69, pl. iii. figs. 40–42, pl. iv. figs. 43–55; *Callizona*, g. n. [Zool. Rec. xiii.]; *C. cincinnata*, p. 71, pl. v. figs. 56–59; *C. nasuta*, p. 72, pl. v. figs. 60–62; *C. grubii*, pl. v. fig. 72, pl. v. figs. 63–66, pl. vi. figs. 69–88; *Rhynconerella capitata*, p. 74, pl. v. figs. 67 & 68.

Anaitis [Malmgr., 1865; Duponch., Lep., 1829] *rosea*, sp. n., McIntosh (51), St. Andrews.

Hyalopomatus, g. n., Marenzeller, Die Cœlenteraten, Echinodermen und Würmer der k. k. öst-ungar. Nordpol Expedition, Denk. Ak. Wien, xxxv. p. 393; a Serpulid with a transparent operculum, and 9–11 gills on either side. *H. clapedii*, pl. iv. fig. 2.

Perrier (54) describes *Perichæta dicystis* and *P. tricystis*, so called from the presence of two and three copulatory pouches respectively.

Polygordius flavo-capitatus, W. N. Ulianin (Hoyer's Report, pp. 389–392).

The following new *Annulata* are described by Gromma as from the Aralo-Caspian Explorations :—*Archæobdella esmonti*, g. & sp. nn., *Clepsine cæcum*, p. 95, *Tubifex deserticola*, p. 108, pl. v. figs. 8–12, *Limnodrilus bogdanowi*, p. 110, pl. v. fig. 13, *Ampharete kalevskii*, p. 112, pl. v. figs. 1–7, and (in pt. ii.) *Amphicteis (Aryandes?) kowalewskii*, pp. 42–44, pl. ix. fig. 7.

Tubifex rivulorum, *T. bonetti*, *Clepsine bi-oculata*, *C. complanata*, *C. marginata*, and *Nephelis vulgaris*, found in Lake of Geneva; Bull. Soc. Vaud. xiv. pp. 203 & 204.

Perrier (54) gives an account of the geographical distribution of some Earth Worms: *Titanus* in Brazil only, *Urochæta* in Brazil, the Antilles, and Java, *Eudrilus* in Brazil and the Antilles, *Perichæta* in Brazil, India, China, Madagascar, Philippines, Antilles, and Peru.

Hansen's paper on "Anneliden fra den norske Nordhavs Expedition." (N. Mag. Naturv.), has not been seen by the Recorder.

Pachydriulus fossor, *P. sphagnetorum*, *Enchytræus pellucidus*, *E. putanus*, *E. adriaticus*, *E. perrieri*, *E. leydigi*, *E. hegemon*, *Achæta eiseni*, spp. nn., Vojdovsky (57).

ANATOMY AND PHYSIOLOGY.

Butschli (40) does not find himself able to agree in many points with Robin; he states further that the gastrula of *Nephilis* does not conform altogether either to the amphigastrula or discogastrula mode.

Hertwig (48) studies the changes in the ovarian egg which lead to the condition in which it is capable of fertilization; these are well seen in *Haemaphys*, where he has observed parts of the nucleolus and of the nucleus go to form a new spindle-shaped nucleus. These studies are in great part comparative (with *Toxopneustes* and *Rana*), but it must be noted that in the *Hirudinea* the germinal vesicle undergoes gemmation before fertilization, and that it is this which causes the nucleus of the ovum to be spindle-shaped; the spindle-fibres are differentiated from the separated granules of the germinal spot. At a certain stage, the spermatid nucleus is found at the centre, and not, as in *Toxopneustes*, at the periphery of the egg. The cleavage-nucleus in all three forms is formed by the fusion of the nuclei of the ovum and sperm.

Barrois gives (39) a brief account of his work on the embryology of Annelids at Roscoff.

Hatschek (46) describes the development of the central nervous system of *Lumbricus rubellus*, and concludes with some theoretical considerations on the relations between the central nervous system of the *Annelida* and *Vertebrata*.

Kowalewsky makes some remarks (Arch. mikr. Anat. xiii. pp. 194-204) on the similarity in the early development of *Amphioxus* and *Lumbricus*, whence he concludes that the supra-chordal nervous system of the *Vertebrata* is homologous with the whole central nervous system of *Vermes*.

Semper (55) discusses the gemmation of the *Naidæ*, as to which no general formula seems possible, since variations appear to be dependent on season and locality.

McIntosh (53) finds that the blood of *Magelona* is densely corpusculated, and is of opinion that this form most resembles in structure the *Spionidæ*. On the circulatory system of *Magelona*; id. M. Micr. J. xvii. p. 256.

W. N. Ulianin is reported by Hoyer as describing the structure of *Polygordius*, and as pointing out that the only essential point of difference between it and the *Chaetopoda* is the absence of setæ; that it is closely allied to *Saccocirrus* (Bobretzky); and that it has no relations to round worms (Schneider).

Turnbull (56) points out that the difference between the ventral cirri of the male and female is greatest in the posterior segments, and between the dorsal cirri in the anterior segments.

The observations of Hensen (47) were chiefly on the large, deep-burrowing form of *L. terrestris*; he concludes that (1) it equalizes the distribution of nutrient material by removing leaves, &c., from the influence of the wind, (2) it aids in the conversion of this material, (3) disposes it in different layers, and (4) opens up paths for and affords nutriment to the roots of plants [*cf.* Nature, xvii. pp. 19, 28, & 62].

Perrier (54) concludes, from his examination of the typhlosole, that this invagination of the intestine belongs to the vascular system.

Moseley (15) describes the colouring matter of a green *Eteone* and of a *Sabella*.

Chatin's first paper (Ann. Sci. Nat. 6, v. No. 9) on the history "du bâtonnet optique chez les Crustacés et les Vers," deals only with the *Crustacea*.

MYZOSTOMATA.

58. GRAFF, L. Das genus *Myzostoma*, F. S. Leuckart. Leipzig: 1877 11 pls.

This volume deals with the anatomy of *M. glabrum* and *M. cirriferum*. The following new species, all from the Philippines (Bohol), are described:—*M. elegans*, p. 22, pl. x. figs. 1–3; *M. elongatum*, p. 22, pl. xi. figs. 1 & 2; *M. dubium*, pp. 22, pl. ix. figs. 2–5; *M. cornutum*, p. 23, pl. x. figs. 4 & 5; *M. brachiatum*, p. 23, pl. ii. fig. 2; *M. verrucosum*, p. 23, pl. ii. figs. 5 & 5A; *M. lobatum*, p. 24, pl. ii. figs. 3 & 4. As to its systematic position, he would unite it with the *Tardigrada* and *Linguatulida* as belonging to the *Stelechopoda*; a group regarded as intermediate between *Vermes* and *Arthropoda*, and distinguished as consisting of forms, not distinctly segmented, hermaphrodite, without distinct circulatory or respiratory organs, and possessing rudiments of four pairs of foot-stumps. A list of the Crinoid hosts is added.

59. GIARD, A. Sur les *Orthonectida*, classe nouvelle d'animaux parasites des Échinodermes et des Turbellariés. C. R. lxxxv. pp. 812–814.

These forms are regarded as standing between the *Dicyemidæ* and the *Gasterotricha* [perhaps it is, at present, safer to regard the *Dicyemidæ* as *Mesozoa*, as distinguished from the *Metazoa*, to which group the *Gasterotricha* appear to belong]. The new form, *Rhopalum ophiocomæ*, was found in *Ophiocoma neglecta*, under both elongated and ovoid forms; both were simple planulæ, but the body was arranged in metameres, which were remarkably differentiated. Another, found in *Lineus gesserensis*, O. F. M., is, in honour of Dr. W. C. McIntosh, called *Intoshia* [this must be *Macintoshia*] *linei*; it has evidently been figured by Keferstein under the name of *Leptoplana tremellaris*, St. Malo.

D'ARCY POWER, Q. J. Micr. Sci. xvii. pp. 132–145, pl. x., gives an account of E. van Beneden's researches on the *Dicyemidæ*, and an account of recent researches on these forms is given in M. Micr. J. xvii. p. 250.

SOLENOGASTRES.

60. GRAFF, L. *Neomenia* und *Chaetoderma*. Z. wiss. Zool. xxviii. pp. 557–570.
61. KOREN, J., & DANIELSSEN, D. C. Beskrivelse over nye arter henhørende til Slægten *Solenopus*. Arch. Math. Naturv. ii. pp. 120–128. [Translated Ann. N. H. (5) iii. p. 321, May, 1879.]

Solenopus appears to be the same as *Neomenia*, Tullberg; the results of the investigation disclose many points of disagreement between the observers; Koren & Danielssen regard the form as Molluscous, and describe as new species *S. affinis*, *S. dalyelli*, *S. incrustatus*, *S. margaritaceus*, *S. borealis*, and *S. sarsi*. [Ihering points out that *Solenopus* was published by Sars without any diagnosis; Morphol. JB. iv. 1878, p. 151.]

Graff has examined *Neomenia carinata*, Tullberg: he finds that the lateral nerve trunks are given off from lateral ganglia (fig. 1), and not (Tullberg) from the supra-oesophageal ganglion; the commissures are connected by a number of lateral trunks, of the existence of which Tullberg was in doubt. The special canal for the longitudinal nerve-trunks observed by Tullberg, is said not to exist. In general, however, the observations of the two anatomists agree. In *Chatoderma*, Graff has now observed an oesophageal ring; the suboesophageal ganglia are smaller than in *Neomenia*. By the aid of transverse sections, a rudimentary ventral groove has now been observed (fig. 2). *Chatoderma* is nearer to the *Vermes*, *Neomenia* to the *Mollusca*; this is most noticeable in the characters of one of the two forms of connective tissue observed in the latter genus.

Chatoderma nitidulum, Lov.: G. A. Hensen's paper in N. Mag. Naturv. has not been seen by the Recorder.

ECHINODERMATA.

BY

C. F. LÜTKEN, PH.D., F.R.D.A.

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2. CARPENTER, P. H. On some points in the anatomy of *Pentacrinus* and *Rhizocrinus*. J. Anat. Phys. xii. pp. 35-53.
3. —. On the genus *Actinometra*, Müll., with a morphological account of a new species (*A. polymorpha*) from the Philippine Islands. J. L. S. xiii. pp. 440-457.
4. DUNCAN, P. M. On the *Salenidae*, Wright. Observations on the morphology of recent *Salenia*, and description of a new species. Ann. N. H. (4) xx. pp. 70-73 & 245-257, pls. ii. n & vii.
5. — & SLADEN, W. P. Report on the *Echinodermata* collected during the Arctic Expedition, 1875-76. *Tom. cit.* pp. 449-470.
6. FOL, H. Sur le commencement de l'hénogenie chez divers animaux. Arch. Sci. Nat. lviii. pp. 439-472 (*cf.* lx. pp. 321-326); Arch. Z. expér. vi. pp. 149-169. Réponse à quelques objections formulées contre mes idées sur la pénétration du zoosperme. Arch. Z. expér. vi. pp. 180-192. *Cf.* also C. R. lxxxiv. pp. 268-271, 357-360, & 659-661, and lxxxv. pp. 233-236 & 625-628; Ann. N. H. (4) xx. pp. 154-156 & 158-160.
7. GASCO, F. Descrizione di alcuni Echinodermi nuovi o per la prima volta trovati nel mediterraneo. Rend. Acc. Nap. xv. 2, pp. 9-11.
8. GIARD, A. (A) Note sur les premiers phénomènes du développement de l'oursin (*Echinus miliaris*); C. R. lxxxiv. pp. 720-722; Ann. N. H. (4) xix. p. 434. (B) Sur certaines monstruosités de l'*Asteracanthion rubens*; C. R. lxxxv. pp. 973 & 974. (C) Sur la fécondation des Echinodermes; *tom. cit.* p. 408-410. (D) Sur une fonction nouvelle des glandes génitales des oursins; l. c. pp. 858 & 859.
9. HERTWIG, O. Weitere Beiträge zur Kenntniss der Bildung, Befruchtung und Theilung des thierischen Eies. Morph. JB. iii. pp. 271-279; Arch. Z. expér. vi. pp. 171-179.

10. KOREN, J., & DANIELSSEN, D. C. [*Echinodermata*] Fra den norske Nordhavs Expedition. N. Mag. Naturv. xxiii. 3, pp. 45–83, pls. i.–v., xxiv. pp. 229–266, pls. i.–iv.
11. LANGE, W. Bemerkungen zum Beitrag zur Anatomie und Histologie der Asterien und Ophiuren. Morph. JB. iii. pp. 449–452.
12. LOCKINGTON, —. List of *Echinidae* now in the collection of the Californian Academy of Natural Sciences, May 1875. P. Cal. Ac. vi. pp. 152–159.
13. LUDWIG, H. Ueber den Nebendarm der Echinoideen. Götting. Anz. 1877, pp. 688–692.
14. —. Morphologische Studien an Echinodermen. (1) Beiträge zur Anatomie der Crinoideen. (2) Zur Anatomie des *Rhizocrinus lofotensis*, M. Sars. (3) Ueber bewegliche Schalenplatten bei Echinoideen. (4) Ueber *Rhopalodina lageniformis*, Gray, und die darauf gegründete Classe *Diplostomidea*, Semper. (5) Beiträge zur Anatomie der Asteriden. Z. wiss. Zool. xxviii. pp. 255–353, pls. xii.–xix.; xxix. pp. 47–86 & 197–205, pls. v.–vii. & xiii.; xxx. pp. 99–162, pls. v.–viii.
15. LYMAN, T. Mode of forking among Astrophytons. P. Bost. Soc. xix. pp. 102–108, pls. iv.–vii.
16. MARENZELLER, E. v. Beiträge zur Holothurien-Fauna des Mittelmeeres. Verh. z.-b. Wien, xxvii. pp. 117–122, pl. v.
17. —. Die Coelenteraten, Echinodermen, und Würmer der kk. oesterreichisch-ungarischen Nordpol-Expedition. Denks. Ak. Wien, xxxv. 42 pp., pls. iii. & iv.; Abstract, SB. Ak. Wien, lxxiv. pp. 136–140.
18. PEREZ, J. Sur la fécondation de l'œuf chez l'oursin. C. R. lxxxiv. pp. 620–622; Ann. N. H. (4) xx. pp. 156–158; C. R. lxxxv. pp. 353 & 354.
19. SARS, M. New Echinoderms. Fauna littoralis Norvegiæ, iii. Bergen: 1877, pp. 49–75, pls. vii. & viii.
20. SELENKA, E. VON. Beobachtungen über die Befruchtung und Theilung des Eies von *Toxopneustes variegatus*. Vorläufige Mittheilung. SB. Soc. Erlang. x. pp. 1–7.
21. SIMROTH, K. Anatomie und Schizogonie des *Ophiactis virens*, Sars. Ein Beitrag zur Kenntniss der Echinodermen, ii. Z. wiss. Zool. xxviii. pp. 419–526, pls. xxii.–xxv.
22. SMITH, E. A. (A) Note on the *Echinodermata* sent by the Rev. G. Brown from the Duke of York Island; P. Z. S. 1877, p. 139. (B) Description of a new form of *Ophiuridae* from New Zealand; Ann. N. H. (4) xix. p. 305, pl. xv. (C) Description of *Acantharachne mirabilis*, a new form of *Ophiuridae*; J. L. S. xiii. pp. 335–337, pl. xviii.
23. THÉEL, H. Mémoire sur l'*Elpidia*, nouveau genre d'Holothuries. Sv. Ak. Handl. xiv. 8, 30 pp., 5 pls. (Abstract, Cefv. Ak. Förh. Bihang, iv. 4.)

24. THIÉL, H.. Note sur quelques Holothuries des mers de la Nouvelle Zemble. N. Act. Ups. (3) vol. extraord. (1877), 18 pp., 2 pls.
25. THOMSON, C. WYVILLE. On the Structure and Relations of the genus *Holopus*. P. R. Soc. Edinb. 1876-77, pp. 405-410.
26. TROSCHEL, F. H. *Rhabdocidaris recens*, sp. n. Arch. f. Nat. xliii. pp. 127-134, pl. viii. Nachträgliche Bemerkung; tom. cit. p. 127. (Additional remarks: Verh. Ver. Rheinl. xxxiv., SB. niederrhein. Ges. 1877, pp. 334 & 335.)

GENERALITIES.

FOL's researches (6) on the primordial changes in the egg, especially that of *Asterias*, tend to show that the disappearance of the "germinal vesicle" and "spot" and the expulsion of the "polar globules" are merely phenomena of the maturation of the ovule, independent of the fecundation; that the "female pronucleus" has no genetic connection with the "nucleolus" of the egg and only a remote one with the "nucleus" (germinal vesicle); and that the spermatozoid exerts upon the vitelline material not only an attraction of contact, but even attraction at a distance. The immediate consequence of the fecundation, during which the body of the spermatozoon flows into the vitellus, is the differentiation of a true vitelline membrane, preventing the other spermatozoa, which are perhaps only a few seconds later than the first, from penetrating. The "male pronucleus," through the fusion of which with the female one the first "nucleus" of the egg owes its origin, is not formed exclusively from the body of the spermatozoid, but probably by its fusion with vitelline elements. The fecundation of immature ova results in their penetration by a large number of spermatozoa, the consequence of which appears to be the formation of several "amphistars," irregular segmentation, monstrous larvæ, &c. HERTWIG's results (9) are on the whole in good accordance with Fol's; this author also refutes the objections raised by GIARD (8) and PEREZ (18).

DUNCAN & SLADEN (5) have recorded 20 species collected during the last polar expedition, among which may be noticed *Solaster furcifer* and *Antedon celticus*, not previously known from higher latitudes, and a new *Asterias*. In MARENZELLER's report (16) 17 species are noticed, among which are *Antedon celticus* and *sarsi*, *Corethraster hispidus*, W. T., and a new *Haplodactyla*. The *Echinodermata* of the deep-sea are often alluded to in Wyville Thomson's "The Atlantic" (vide *infra*). The observations on reproduction and growth, recorded in Zool. Rec. xiii., are reproduced, i. pp. 215-244; on their frequency and occurrence at the greatest depths, &c., ii. pp. 346-348.

HOLOTHURIIDÆ.

Haplodactyla arctica, sp. n., Marenzeller (16), p. 29, pl. iv. fig. 1 (78° 58 N. lat., 260 mètres). The anatomy is also worked out. It is described as having 15 cylindrical tentacles. *H. oolitica*, Pourt., and *Molpadia*

borealis, Sars, probably belong to the same genus as the new arctic species. According to Koren & Danielssen (10), they are however congeneric with *Trochostoma thomsoni*, g. & sp. nn., l. c. pp. 229 *et seq.*, pls. i.-iii. (62° 44' to 67° 24' N. lat., 1° 46' to 9° E. long.), which presents the following characters:—Body subcylindrical, truncated anteriorly, produced posteriorly into a short tail-like portion; skin highly scabrous from solid calcareous bodies and perforated plates; oral disk with fifteen tubular prolongations from the body cavity, separated by an equal number of furrows, in the dilated extremities of which are placed fifteen rudimentary tridigitate tentacula; vent with five papillæ; no feet; a polian vesicle, madreporic tube, &c.; two free, ramified lungs (in the young state these organs are less developed and mere appendices of the intestinal cavity, having the same contents, &c.). The anatomy is fully worked out.

THÉEL (24) has established a new family, *Myriotrochidae*, for *Myriotrochus rinki*, Stp. (which is redescribed, examined anatomically and illustrated) and *Trochoderma elegans*, g. & sp. nn. (Nova Zembla and Karian Sea, 5-60 fathoms). Body cylindrical, without feet; sexes separate as in *Myriotrochus*; without respiratory organs; skin hard and friable, densely studded with several layers of large wheels with 10-16 rays and a muricate circle; tentacles six-lobed, ten, without spicules; one polian vesicle; intestine S-shaped, &c. In this genus, and in *Myriotrochus*, the existence is proved of ten sense-organs (auditory? but without otoliths) placed in pairs at the origin of the five nerve trunks.

Of *Oligotrochus vitreus* and *Stichopus natans*, a detailed account is given by the late M. Sars (19), pp. 49-65, pl. vii.

Elpidia glacialis, g. & sp. nn., Théel (23), type of a new family, *Elpidiidae*, taking, though without lungs, an intermediate position between *Apneumona* and *Pneumatophora*. Body bilateral, back convex, belly flat, mouth anterior, but ventral, vent posterior, turned somewhat towards the same side; tentacles ten, cylindrical; four pairs of ambulacral feet, lateral, near the margin between back and belly; feet-like dorsal appendages, 7-13, approximately biserial; skin semipellucid, thin, friable, studded, like the tentacles, the ventral and dorsal feet, with branched spicules, a few large wheels, and many small ones of a different structure. A soft conical appendage may be protruded from the stiff, almost immovable, ventral and dorsal feet; from the tentacles, two similar digits from the extremity, three from the base (Karian Sea, 75° 24' N. lat., 66° 24' E. long., 70-230 mètres; off Greenland, 1620 mètres).

Allied abyssal *Holothuriide* are alluded to in "The Atlantic," i. p. 132, ii. p. 348. To this family further belongs *Irpa abyssicola*, Kor. & Dan., g. & sp. nn., (10) p. 29, pl. iv., differing through the more elongate, almost cylindrical shape of the body, the coriaceous lubrical skin, the less ventral position of the mouth, the hand-shaped tentacula with numerous (15) digitations; the lateral ambulacral feet in twelve pairs (nine on each side, and six posterior, making twenty-four in all); dorsal appendages, four pairs and two intermediate, all placed anteriorly; skin with few spicules and no wheels; tentacles, feet, &c., studded with spicules (63° 22' N. lat., 1° 20' W. long., 1050 fathoms).

Both genera are also worked out anatomically; they are apneumous, have an intestinal channel of the usual S-shape, but only two latero-ventral ambulacral canals, answering to and communicating with the latero-ventral series of feet; the dorsal feet are entirely excluded from any communication with the aquiferous system. In *Elpidia*, the ambulacral canals are divided into chambers, each chamber corresponding to one foot. In this genus also auditory vesicles were observed, with otoliths, one near the origin of each of the four nerve-trunks (the dorsal and the latero-ventral) and one (or two) where the nerve-branches spring from the latero-ventral trunks. In both genera the chalk-ring has quite a peculiar character, it consists of five, radially placed, chalk-stars, with eight long branches, forming, by certain branches being placed alongside of each other, a regular pentagon, &c. The end of the madreporic tube is attached, not floating freely, &c.

A renewed examination of *Rhopalodina lageniformis* has shown (14, 4) that it is only an abnormal Holothurian, and that the order "*Diptostomidea*" must be abolished. The ambulacra originating from the mouth are continued directly, at the bottom of the dilated portion of the flask-shaped body, in those terminating at the vent; the transformation of an ordinary sea-cucumber into *Rhopalodina* might be effected through the shortening and absolute suppression of the dorsal inter-radial area, in such a manner that mouth and vent were brought into immediate contact and juxtaposition.

Cucumaria marioni, Marenzeller (15), p. 117, pl. v. fig. 1 (Marseilles); *Holothuria helleri*, id. (= *affinis*, Heller), l. c. p. 119; *Thyone raphanus*, K. & D., from Marseilles, *ibid.* pl. v. fig. 2.

ECHINIDÆ.

LUDWIG (14, 3) has made the discovery, that in several (probably all) *Spatangidæ* the plates of the odd interambulacrum, nearest to the periproct, are connected with each other by a strip of true muscular tissue, situated in a longitudinal furrow corresponding to the median line of union of the two series of plates. The want of a muscular connection between the plates of the perisome (not to be confounded with its pliability in *Perischechinidæ*, *Cidaridæ*, *Echinothuriidæ*, &c.), therefore can no longer be upheld as an absolute character of the *Echinidæ*. This observation also explains the fractured state of the corresponding part of the shell so often found in fossil *Spatangidæ*.

Notes by G. MCINTOSH on the microscopical structure of spines of *Echinidæ*, and on the teeth, sphæridia, gills, spicules, &c., are shortly recorded in Q. J. Micr. Sci. xvii. pp. 104-106, 191, 192, 195, 303, & 463 FREDÉRIQ'S notes on the anatomy and physiology of *Echinidæ* [cf. Zool. Rec. xiii.] are translated in Ann. N. H. (4) xix. pp. 195-198. A note by GIEBEL on *Echinothrix desori*; Z. ges. Naturw. (3) ii. pp. 319 & 320.

DUNCAN (4) has demonstrated the existence of sphæridia in a recent *Salenia* (*S. profundæ*, sp. n.), near the peristome, on the ambulacra; also the existence of pedicellariæ on the test and apical disk; with further descrip-

tive details on the actinostome, the spines, the apical disk, &c.; *S. varispina*, Ag., is referred to *Peltaster*.

The following new species (or new to the Mediterranean fauna) are described and figured by Gasco (7):—*Metulia costæ*, sp. n. (l. c. p. 4, figs. 1 & 2); *Echinocardium flavescens*, Ag. (p. 6, fig. 3). The following are described and figured in Wyville Thomson's "The Atlantic":—*Salenia varispina*, Ag. (i. pp. 145 & 146); *Phormosoma uranus*, sp. n. (pp. 146 & 147) (1090 fathoms, S.E. of Cape St. Vincent); *hormacantha*, sp. n., W. Th. (South Sea, east of Sydney, 400 fathoms); *Aceste bellidifera*, g. & sp. nn. (pp. 396–398) (off Gomera Island, 600 fathoms, and 2500 fathoms, off Sandy Hook); *Calymne relicta*, g. & sp. nn. (pp. 396–398) (Gulf Stream, 2650 fathoms); *Goniocidaris canaliculata*, Ag. (ii. p. 224), *Cidaris nutrix*, W. Th. (p. 227); *Hemiaster philippii* (Gr.) (pp. 229–234); *Aerope rostrata*, g. & sp. nn. [Zool. Rec. xiii. *Ech.* p. 12*] (i. pp. 380–382) (Gulf Stream, 1240 fathoms). From the descriptions of the new genera the following preliminary information may be gathered:—

Calymne, allied to the *Ananchytidae*. Test oval, with a longitudinal ridge above, nearly flat below; a peripheral fasciole; mouth oval (in the longitudinal direction), placed anteriorly; apical system disjunct; two ovaries, and two ovarian pores, answering to the anterior interambulacra; vent posterior; ambulacral pores single, minute.

Aceste, allied to *Pourtalesia*. Test oval, depressed; apex with two ovarian apertures near the posterior extremity; mouth at the bottom of a deep anterior groove; nearly the whole of the dorsal surface occupied by a large depression; vent posterior; apical system not disjunct; feet of the odd ambulacrum with large flower-like terminal disks; pores of the paired ambulacra single.

Rhabdocidaris recens, sp. n., Troschel (26) (Singapore), probably identical with *R. bispinosa*, (Lmk. ?) Loriol. Crenulated tubercles are found in several recent *Cidaridæ*.

LOCKINGTON (12) gives several new localities for various exotic Sea-urchins.

ASTERIDÆ.

LUDWIG'S (14, 5) researches have elucidated and partly, it is probable, settled some of the most intricate and disputed points in the anatomy of Starfishes, which have during late years been studied by various observers without attaining at definite results, the observations recorded being, to a certain degree, contradictory. As such points, the following are here noticed:—The pore-canals of the madreporite only communicate with the aquiferous system, viz., the stone-canal and its ampulla. A ring-muscle of the annular aquiferous vessel does not exist. The "corpuscles of Tiedemann" communicate with that vessel, not with the perihæmal, or with the true sanguiferous systems. The "gill-like organ" of Greeff is identical with the "heart" of Tiedemann; this organ (analogous to the "dorsal organ" of Crinoids) is really contractile and a

* Zool. Rec. xiii. *Ech.* 12, 16th line from bottom, for *one* ambulacrum read *odd* ambulacrum.—C. F. L.

vascular plexus; it is continued in one direction into an annular vessel (or rather vascular plexus) around the mouth, which gives off radial vessels (or plexus) to the arms, in the other into the dorsal ring-vessel (vascular plexus), with its branches to the intestine and genital organs. These vessels which, for the greater part, have hitherto been overlooked, are placed, in the arms, in the septa dividing the perihæmal canals between the radial nerve and the aquiferous ambulacral canal, around the mouth in the membrane separating the outer and inner perihæmal ring-canals; the "sac-shaped organ," enclosing the "heart" and "stone canal," is a continuation of these perihæmal spaces, which are on the other hand continued in the perihæmal canals, enclosing the dorsal, genital, and intestinal vessels, hitherto commonly confounded with these vessels themselves. These perihæmal spaces are further continued into the subcutaneous system of cavities between the inner and outer (calcified) layers of the skin; a communication with the common perivisceral canal, however, is not discovered. Of the parts considered as nerves, the outer cellular portion is a continuation of the common ectodermal epithelium; the thicker, inner, longitudinally fibrillated stratum, though permeated by, or enclosed between the fibrillar prolongations of the epithelial cells, is the true nervous substance. Genital pores are probably present in all Starfishes; they communicate directly, through short oviducts or spermoducts, with the interior of the genital organs, which are surrounded by vascular sinuses; these are direct continuations of the cavities of the genital sanguiferous vessels.

AGASSIZ (1) has republished his researches on the embryology of *Asterias pallida* and *berylina*, printed several years ago for the intended fifth volume of the "Contributions to the Natural History of the United States," and published (or distributed in advance of the intended volume) in 1864; the concluding chapter treats of the plan of development of Echinoderms generally, defending its homological identity in the various types, notwithstanding the modifications which it undergoes in each of them; also the typical agreement between Ctenophorous Acalephs and larval Echinoderms, and the impropriety of placing *Echinodermata* and *Cœlenterata* in different chief divisions of the animal kingdom. Short notes are added referring to investigations of later years. The second part of the volume gives a series of beautiful illustrations and descriptions of North American Starfishes, especially their hard parts, prepared by the late L. Agassiz for this volume, but first published now "as showing the systematic value of characters almost completely neglected," and illustrating several genera not previously figured.

The American Starfishes figured by Agassiz (*l. c.*) are, *Asteracanthion berylinus*, Ag. (pl. ix.), *Asterias ochracea*, Brdt. (pl. x.), *Echinaster sentus* (Say) (pl. xi.), *Crossaster papposus* (L.) (pl. xii.), *Pycnopodia helianthoides*, Brdt. (pl. xiii.), *Linckia guildingi*, Gr. (pl. xiv. figs. 1-6), *Asterina folium*, Ltk. (*ibid.*, figs. 7-9), *Asteropsis imbricata*, Gr. (pl. xv.), *Pentaceros reticulatus*, L. (*gigas*, L.) (pl. xvi.), *Solaster endeca* (L.) (pl. xvii.), *Cribella sanguinolenta* (Müll.) (pl. xviii.), *Astropecten articulatus* (Say) (pl. xix.), *Luidia clathrata* (Say) (pl. xx.). That *Solaster* and *Cribella* should be placed with the *Asterinidæ*, *Crossaster*, and *Pycnopodia*, in close

proximity to *Brisinga*, are modifications of Perrier's system (Zool. Rec. xii. pp. 550 & 551) suggested by the examination of the dermo-skeleton.

M. Sars (19). *Pteraster multipes* (p. 65, pl. viii. figs. 1-17), with parts of *P. militaris*, *pulvillus*, and *Asterias glacialis* (figs. 18-23), and *Goniaster hispidus*, sp. n. (p. 72, pl. viii. figs. 24 & 25).

Koren & Danielssen (10). *Solaster affinis*, Brdt. (290 fathoms, 64° 35' N. lat., 10° 20' W. long., hitherto only known from Berings' Sea, with ten arms, p. 13; *Archaster tenuispinus*, D. K., p. 15 (supplemental description, pl. iii. fig. 7); *A. pareli*, D. K., var. *longo-brachialis*, p. 17 (61° 40' to 64° 50' N. lat., 20° to 40° E. long., 151-214 fathoms); *A. pallidus*, sp. n., p. 18, pl. iii. figs. 1-7 (62° 44' to 65° 55' N. lat., 30° W., to 50° E. long., 400-1180 fathoms); *Hymenaster pellucidus*, W. T., p. 24, pl. iv. figs. 1-14; *H. nobilis* is refigured in W. Thomson's "Atlantic," ii. pp. 240 & 241; *Leptychaster kerguelensis* [= *Archaster excavatus*, W. T.], *ibid.*, p. 235.

Gasco (7) describes and figures the following species from the Mediterranean:—*Ophiaster lessonæ*, sp. n. (p. 8, figs. 4 & 5), *Asteropsis caprensis*, sp. n. (p. 9, figs. 6 & 7), *Asteriscus* [*Asterina*] *pancerii*, sp. n. (pp. 8 & 9) (a young *A. verruculata* figured for comparison, fig. 10), and *Gonioliscus placentiformis*, Hell. (fig. 11).

Asteracanthion [*Asterias*] *palæocrystallus*, sp. n., Duncan & Sladen (5) p. 455 (Discovery Bay and Cape Fraser, 25-80 fathoms).

OPHIURIDÆ.

Ophiopertis, g. n. Disk granular (no radial shields) as in *Ophiocoma*; teeth, tooth-papillæ, oral and adoral shields, and the mouth-slits as in *Ophiothrix*; oral papillæ small, hardly distinguishable from the tooth-papillæ; brachial shields and true spines similar to those in *Ophiocoma*; 2-3 compressed, imbricated, scale-like spines above the uppermost true arm-spines; ten genital slits; ambulacral scale present. *O. antipodarum*, sp. n., Smith (22 v) (New Zealand).

Acantharachna, g. n. (subg. of *Ophiomastix*). Discus cute molli, minute squamata, spinas paucas supra et infra gerente, inductus; scuta radialia nuda; dentes, papillæ dentales et orales *Ophiocomæ*; squamæ ambulacrales nullæ; spinæ brachiales supremæ maxime irregulariter positæ. *A. mirabilis*, sp. n., Smith (22 c) (Philippine Islands).

Ophionereis albo-maculata, sp. n., *id.* P. Z. S. 1877, p. 92, pl. xi. figs. 1-5 (Galapagos Islands).

Ophiopleura, g. n. Skin of the disk firm, naked, smooth, covering a rich squamification; arms also covered by a smooth, delicate skin which is produced on the spines, but allows the plates to be seen; ten elevated ribs on the back of the disk; mouth-papillæ bordering the mouth-slits on both sides, flat, with smooth rounded margins; teeth depressed, with a broad base, forming irregular series; ambulacral papillæ present; ten genital slits. *O. borealis*, sp. n., Koren & Danielssen (10), p. 33, pl. v. figs. 1-4 (63° 5' N. lat., 3° to 0° 50' E. long., 510-570 fathoms). (Regarded as the type of a new family, *Ophiopleuridæ*.)

Astrophyton malmgreni, sp. n., *id.* l. c. p. 37 (62° 44' to 64° N. lat., 3-46° E. long., 400-510 fathoms).

Ophiomusium pulchellum, sp. n., and *Ophiacantha chelys*, sp. n., dredged off Madeira, in 1675 fathoms, in Wyville Thomson's, "The Atlantic," ii. p. 63, the last-named species on *Corallium*; *Ophioglypha bullata*, id. l. c. pp. 400-402 (2650 fathoms, Gulf Stream, but universally distributed in the Atlantic and Southern Sea). *Ophiacantha vivipara* is refigured, l. c. ii. p. 242.

The genital slits of the *Ophiuridæ* do not lead into the general cavity of the body, but into genital pouches, or special cavities into which the true orifices of the sexual glands are placed; Ludwig (14, 5).

On the schizogony and reconstruction of *Asteridæ* and *Ophiuridæ* (*Ophiastis*), the detailed investigations of Simroth (21) are to be consulted; the division is not accidental, and is repeated several times; in the work of reconstruction, a prominent part is taken by the so-termed aquiferous system. Considerations and remarks of a more general character, or the comparative morphology of the five principal types of *Echinodermata*, based upon the author's investigations of the anatomy of *Ophiastis*, and the development of its constituent parts during the regenerative process, are adduced.

CRINOIDÆ.

The admirable researches of LUDWIG (14, 1 & 2) have apparently almost exhausted the subject of the anatomy of Crinoids (especially *Comatula* or *Antedon*), in such a manner that most of the more important disputable points discussed by late observers may be regarded as definitively settled, and comparatively little remains still as dubious. A radial nerve underlies, as in the *Asteridæ*, the epithelium of the ambulacral furrows of the disk, arms, and pinnulae, uniting with its fellows to form a circum-oral ring. Between the radial nerve and the radial (ambulacral) aquiferous tube, a radial sanguiferous vessel is situated, forming likewise an oral ring, lying close to the nerve ring, and to the ring-shaped central portion of the aquiferous system; this ring-shaped blood-vessel is provided with appendages, communicating by their ramifications with the vascular plexus of the visceral cavity. In like manner, the ambulacral ring-tube is provided with numerous tubular prolongations, "stone canals," suspended in the body cavity and communicating through their terminal apertures with the lacunar system. Numerous pores, widening into small fimbriating cavities, and arranged rather regularly in the inter-radial and inter-palmar areas of the perisome (rarely also continued on the proximal part of the arms), lead the sea-water into the body-cavity, and play the part of the "madreporites" in other *Echinodermata*. (In *Rhizocrinus*, the number of madreporic pores and stone-canals is reduced to a single one in each of the 5-7 divisions of the disk.) The relatively large ventral and dorsal canals, or tubiform cavities, of the arms (sometimes subdivided by septa, often communicating largely with each other; in *Rhizocrinus* reduced to a single one in the distal portion of the arms) are only prolongations of the body-cavity, originating the first from the axial, the second from the circum-visceral part of the body-cavity. The genital canal, situated in the septum between the "dorsal" and "ventral" canal,

is likewise a prolongation of the inter-visceral body-cavity; it contains suspended the genital vessel, enclosing the true genital tube, whose internal investing cells give origin to the ova or sperm-cells in the inferior (proximal) pinnulæ, while it commonly remains sterile in the arms themselves and in the oral pinnulæ. Special apertures are formed for the exit of the sperma, probably also for that of the ova. The coloured globular corpuscles accompanying the tentacles (falsely interpreted as "calcareous glands," or as sense-organs) are also found in the body-cavity along the intestinal tube; they are not wanting, though colourless, on the ambulacra of *Rhizocrinus*. The enigmatical five-chambered organ, situated in *Antedon*, etc., in the centro-dorsal knob, below the transformed basalia [on its somewhat different placement in other recent and fossil genera, compare especially Carpenter (2)] turns out to be only the dilated inferior portions of five vertical vessels, the outermost of an axial bundle, prolonged from the stem through the funnel in the centre of the first radials, and continued into the "dorsal organ," which is a vascular plexus, corresponding with the "heart" of starfishes, and communicating distally with the œsophageal and visceral vascular plexus. (In *Rhizocrinus*, the axial vessel appears to be single, not a plexus.) The cirral vessels spring from the inferior end of these axial vessels, or (the five uppermost) from the five chambers themselves; they are enclosed in fibrillar sheaths, prolongations from the fibrillated substance surrounding the five-chambered organ and its dependancies. The "ostia dorsalia" of this organ are (Carpenter) the remnants of the prolongation into the stem of the five peripheral vessels encircling the axial vessel in stalked Crinoids or crinoidal larvæ. In *Pentacrinus*, the cirral vessels spring from similar heart-like dilatations of the five peripheral vessels of the stem, exactly the counterparts of the single one remaining in the calyx of free Crinoids (Carpenter, 2). [Compare also this author concerning the somewhat different placement of this organ in *Rhizocrinus*, and in other recent or fossil genera.] The axial cords of the arms and radii also originate from the fibrillated mass surrounding the "chambered organ," but contain no vessels, nor can they, according to Ludwig, be regarded as an anti-ambulacral nervous system, as indicated by the suggestive experiments of W. Carpenter; they are, in Ludwig's opinion, essentially the uncalcified remnants of the connective tissue of the rays, though they may have, physiologically, other nutritive functions to perform. The structure of *Rhizocrinus*, as far as the soft parts are concerned, is in all important points analogous to that of *Antedon*, etc., but somewhat more simple. As to the interpretation of the parts regarded as "basalia" and "uppermost stem-segment" in *Rhizocrinus*, by Sars, Pourtalès, Ludwig, and Carpenter respectively, there is still a difference of opinion.

P. CARPENTER'S second (preliminary) paper (3) discusses the relations of *Antedon* and *Actinometra*, which latter genus is redefined (in accordance chiefly with the observations of the Recorder), and limited to the species with excentric mouth and (commonly) flagelliform and pectinated oral pinnulæ. It is further shown that in some *Actinometra* the mouth is placed radially, in others inter-radially, and that in several species there is

a marked difference between the oral (anterior) and anal (posterior) group of arms, these last being, to a certain but very variable degree, devoid of tentacles, ambulacral grooves, and sub-epithelial (nervous) band (but not of the ambulacral aquiferous tube). The author further dwells on the difference of the "rosette" (transformed basals) in *Antedon* and *Actinometra*, and between *Comaster* and *Solanocrinus*.

On *Holopus* and its relation to *Cyathidium*, vide the note of C. W. THOMSON (25). In this author's "Atlantic" are figured *Pentacrinus maclearanus*, sp. n. (ii. p. 124) (400 faths., off Brazil) (living unattached?), *Hyoocrinus bethellianus* (ib. pp. 96-99), and *Bathyrinus aldrichianus* (p. 93). *Ilycrinus* (g. n.) *carpenteri* (sp. n.), Koren & Danielssen (10), (1050-1495 faths., 63° 22' to 65° 55' lat. N. and 0° 36' lat. E. to 7° 20' lat. W.), will probably also include the last-named generically; it has a long stem, articulated almost as in *Rhizocrinus*, but without cirri, divided distally into branching roots, calyx not supported upon dilated stem-joints, composed of five coalesced small basalia, and fifteen (3 × 5) radialia, those of the inferior circle coalesced, arms ten, not branched, syzygia with short intervals along the arms, pinnulæ about eleven on each side, first pinnula on the eleventh brachial segment, sexual products in the inferior pinnulæ, mouth and oral ring covered by five oral plates, anal tube inter-radial, &c.

FOSSIL ECHINODERMS.*

G. COTTEAU, Échinides fossiles du département de l'Yonne, Terrain Crétacé, livr. 36-39; *id.*, Paléontologie Française, Échinides réguliers, Terrain jurassique, livr. 38, feuil. 12-14, pls. 191 & 192. DAMES, Die Echiniden der vicentinischen und veronesischen Tertiär-Ablagerungen, Palæontographica, xxv. pp. 1-100, pls. i.-xi. P. M. DUNCAN, On the *Echinodermata* of the Australian Cainozoic (tertiary) Deposits, J. G. Soc. xxxiii. pp. 42-73, pls. iii. & iv. (*Monostychia*, Laube, is referred to *Arachnoides*; a new genus, *Megalaster*, is proposed for a Spatangoid allied to *Cardiaster*). E. FAVRE, Étude stratigraphique de la partie S.O. de la Crimée, suivie de la description de quelques Échinides de cette région: Genève. A. LOCARD, Description de la faune des terrains tertiaires moyens de la Corse; description des Échinides par G. Cotteau, 320 pp., 7 pls.: Lyon. K. v. FRITSCH, Die Echiniden der Nummulitenbildungen, Palæontographica, Suppl. Bd. iii. p. 85, *et seq.* C. EVANS, On the forms of the genus *Micraster* common in the chalk of West Kent and East Surrey; P. Geol. Ass. v. p. 149, *et seq.* L. LÓCZY, Néhány Echinoida a Fehérkörös-völgy neogen rétegeiből; Term. Füzetek, i. p. 39. R. TATE, On new species of *Salenia* from the middle tertiaries of South Australia; J. G. Soc. xxxiii. pp. 256-259. J. YOUNG, Notes on *Archæocidaris*, a carboniferous Echinoderm, with overlapping plates; P. N. H. Soc. Glasg. ii. p. 225, *et seq.*

C. DAEMER, Die ost-thüringischen Encriniten; Jen. Z. Nat. xi.

* The Recorder has been obliged to give the titles of several papers of Fossil Echinoderms, Corals, &c., on second-hand information only, the periodicals, &c., containing them not being accessible to him. He therefore cannot warrant the accuracy of the details of this list.

pp. 382-402, pl. xxiii. LORIOU, Monographie des Crinoïdes fossiles de la Suisse, 1ère partie; Abh. d. schweiz. paläont. Ges. iv. C. A. WHITE describes two new Devonian Crinoids, from Iowa; P. Ac. Philad. 1876, p. 28-30 (*Strobilocystites*, g. n.). W. M. GABB describes (*tom. cit.* pp. 175-179, pl. v.) remains of cretaceous *Pentacrini* and *Goniaster*. A new genus of Crinoids (Cambrian), *Macrocystella*, Callaway, is described; J. G. Soc. xxxiii. p. 670, pl. xxiv. fig. 13. W. PERCY SLADEN, On the genus *Poteriocrinus*, and allied forms; P. Geol. Polyt. Soc. (2) iv. p. 242, *et seq.* NIKITIN, Ueber *Mesites pusirefskii*, Hoffm., eine merkwürdige Cystideen-Art.; Bull. Mosc. lii. 1, pp. 301-304, pl. iv. O. WACHSMUTH, Notes on the internal and external structure of palæozoic Crinoids; Am. J. Sci. (3) xiv. pp. 115-127, 181-191 [contains important information on the organization of palæozoic Crinoids, but wanting further exposition and illustration. "*Palæocrinoidea*" is proposed as a sub-order, comprising *all* true Crinoids from palæolithic strata, characterized through the closed vault of the calyx, covered by solid plates, without any external mouth, the true mouth being internal, communicating through subteguminal ducts with the brachial ambulacra]. *Id.* & F. SPRINGER, Revision of the genus *Belemnocrinus*; *op. cit.* xiii. pp. 253-260.

CŒLENTERATA.

BY

C. F. LÜTKEN, PH.D., F.R.D.A.

ANTHOZOA.

1. ANDRES, A. On a new genus and species of *Zoanthina malacodermata* (*Panceria spongiosa*, sp. n.). Q. J. Micr. Sci. xvii. pp. 221-225, pl. xvi.
2. BRÜGGEMANN, F. Neue Korallen aus dem rothen Meere und von Mauritius. Abh. Ver. Brem. v. pp. 395-400, pls. vii. & viii.
3. —. Notes on Stony Corals in the Collection of the British Museum. 1. Description of two new species of *Turbinariida*. 2. Remarks on the species of *Seriatopora*. 3. A revision of the recent solitary *Mussaceæ*. Ann. N. H. (4) xix. pp. 415-421; xx. pp. 300-313.
4. DUNCAN, P. M. On the rapidity of growth and variability of some *Madreporaria* on an Atlantic Cable, &c. P. R. Soc. xxvi. pp. 133-137; Ann. N. H. (4) xx. pp. 361-365.
Cable fished up from 522-550 fathoms, N.W. of Spain; coral-growth consisting of species of *Desmophyllum*, *Lophelia*, *Solenosmilia*, *Amphihelia*, and *Caryophyllia*; rapid rate of growth; large variability of certain species.
5. HEIDER, A. v. *Sagartia troglodytes*, Gosse; ein Beitrag zur Anatomie der Aktinien. SB. Ak. Wien, lxxv. pp. 367-418, pls.
6. KLUNZINGER, C. B. Die Korallthiere des rothen Meeres. Erster Theil. Die Alcyonarien und Malakodermen. Berlin: 1877, 98 pp., 8 pls.
7. KOCH, G. v. Mittheilungen über Cœlenteraten. Anatomie von *Stylophora digitata*, Pall. Jen. Z. Nat. xi. pp. 375-381, pl. xxii.
8. KOREN, J., & DANIELSEN, D. C. (A) Beskrivelse over nogle nye norske Cœlenterater. (B) Bidrag til de ved den norske Kyst levende Pennatuliders Naturhistorie. Fauna littoralis Norvegiæ. III. Bergen: 1877, pp. 77-103, with plates.
9. LINDSTRÖM, G. Contributions to the Actinology of the Atlantic Ocean. Sv. Ak. Handl. xiv. 6, 26 pp., 3 pls.

first of 2nd part

10. MOSELEY, H. N. On new forms of *Actinaria* dredged in the deep sea; with a description of certain pelagic surface-swimming species. Tr. L. S. (2) i. pp. 295-305, pl. xlv.
11. NARDO, G. Sull' Antipate dell' Adriatico, memoria postuma del celebre vitaliano Donati, sfuggita all' occhio dei naturalisti. Atti Inst. Ven. (5) iii. pp. 673-678.
12. STUDER, T. Uebersicht der Steinkorallen aus der Familie der *Madreporaria aporosa*, *Eupsammina*, und *Turbinarina*, welche auf der Reise S.M.S. "Gazelle" um die Erde gesammelt wurden. MB. Ak. Berl. 1877, pp. 625-655, pls. i.-iv.

GENERALITIES.

HEIDER's paper (5) is a valuable contribution to the histological anatomy of the *Actiniida*. The existence of a circular canal (a series of orifices in the septa, just within the lip) is demonstrated; there are neither labial muscles nor any sphincter around the inferior opening of the "gastral" cavity, no inferior tongue-like productions of the folds of the mouth-angles, no nervous system, and no special organs of sense. The "gastral" cavity is lined with ectoderm, all the internal parts with endoderm, excepting the mesenterial filaments, whose "epithelium" is very much like the ectoderm. The gastral tube, the tentacles, and the oral disk have, between the mesoderm (connective tissue) and the ectoderm, a layer of longitudinal muscles, between the mesoderm and the endoderm one of transversal muscles; in the lateral body-wall, the longitudinal muscles are wanting, in the basal wall also the circular. The ectoderm is made up of ciliated, glandular, and nematocyst-producing cells, the latter provided with "cnidocils." The holes of the body-wall (cinclides), through which the mesenterial filaments are protruded, are not pre-formed, but produced through the pressure on the soft, yielding tissues. The warts of the skin (suckers) are composed of peculiar glandular cells. The extremities of the tentacles are provided with a pore. The genital organs are apparently formed in the mesodermal connective tissue of the septa. The special muscles of the larger septa are placed on the adverse sides of the septa, forming each sub-tentacular space. The whole external and internal surface of the *Actinia* is provided with moving cilia. The food consists to a large degree of microscopical organisms, but parts of larger animals are also devoured. In *Panceria* (1) the "circular canal" is wanting; an inferior sphincter is present; not all the septa are provided with filaments; the so-termed "branchiæ" or "hepatic organs" are, histologically, mere outgrowths of the mesenteric folds; basally, the branching septa are connected into a spongy network, continued into the cœnenchyma, &c. Koch's anatomy of *Stylophora* (7) is also a valuable contribution to the little known anatomy of stony corals.

Notes on growth of corals, Am. J. Sci. (3) xiii. p. 66, Ann. N.H. (4) xix. p. 276, M. Micr. J. xviii. p. 192; on deep-sea corals generally, WYVILLE THOMSON, Atlantic, ii. pp. 344-346. On red-coral-fishing off Cape Verde Islands, *tom. cit.* pp. 76 & 77; on coral reef at the Bermudas,

op. cit. i. pp. 302-304; deep-sea corals in the Antillean sea, *l. c.* pp. 265-271. Notes on rare and remarkable *Anthozoa* and *Hydrozoa* dredged in rather deep water off the coast of New England and Nova Scotia, by A. E. VERRILL, in "Notice of recent additions to the marine fauna of the eastern coast of North America," *Am. J. Sci.* (3) xvi. pp. 212 & 213, & 374-378.

LINDSTRÖM (9) has published a list of corals collected at some of the Lesser Antilles (St. Bartholomew especially), on the shores and at 200-300 fathoms, on the Josephine Bank (36° 46' N. lat.), &c. Eleven species are common to both sides of the Atlantic, all from 100-980 fathoms. Most of these widely distributed corals are but little variable, specimens from off Florida closely resembling those taken off Portugal, or, if highly variable, presenting almost identical varieties. Lindström comments upon the unsatisfactory condition of Actinology, the knowledge being almost exclusively confined to the skeleton-characters, while we are unable to do justice, in systematizing, to some striking analogies between the soft parts, for instance, of *Corynactis* and *Caryophyllia* [or of *Corallimorphus* and *Stephanophyllia*; cf. Moseley (10)]; also on the slight value of certain characters derived from the epitheca or "paluli," the fixed or free, single or compound, state of the coral, &c. Moseley (10) dwells upon the fact that shallow-water genera are not considerably modified at considerable depths (*Edwardsia*), even not when exchanging the light and heat of shallow tropical seas for the darkness and icy cold of the deep sea (*Cerianthus*). Klunzinger (6) enumerates 76 species of *Alcyonaria*, *Antipathidae*, and *Malacodermata* from the Red Sea; the new species and those figured are enumerated below. In like manner, Studer's (12) synopsis of species collected on several reefs in the Pacific, or dredged at large depths, is recorded.

GENERA AND SPECIES.

(*ACTINIIDÆ*). *Corallimorphus*, g. n., Moseley. Body rigid, smooth, gelatinous, not contractile, without pores, but with an adherent base; disk large, circular; tentacles non-retractile, elongate, conical, with a rounded terminal knob, of several sizes, disposed in regular series at the margin of the disk and in two circlets on its surface. *C. profundus*, sp. n., *id.* (10), p. 300, pl. xlv. figs. 7 & 8 (South Pacific, 2025 fathoms, attached to a manganese nodule); *rigidus*, sp. n., *id. l. c.* p. 301, figs. 9 & 10 (among the Moluccas, 1425 fathoms).

Nautactis purpureus, sp. n., *id. l. c.* p. 295, pl. xlv. figs. 1 & 2. A small floating *Actinia*, differing from *N. olivacea* in the nature of the tentacles, among which none are multilobate (between the New Hebrides and Australia). A small larval Minyad obtained off the Philippines; *id. l. c.* fig. 3.

Oceanactis, g. n., *id.* Body transparent, smooth, spherical when contracted, hemispherical when expanded, provided with rounded costal ridges and a single row of tubercles; tentacles simple, elongate, conical in two rows; base very small, entirely invisible in the contracted condition, with an aperture in the centre communicating with the body cavity. *O. rho-*

podactylus, sp. n., Moseley, *l. c.* p. 296, pl. xlv. fig. 4 (trawled off New Zealand, but probably pelagic).

Actinia abyssicola, sp. n., *id. l. c.* p. 297, pl. xlv. fig. 5 (40° 17' N. lat., also S. W. of Bermuda, 1075–1350 fathoms, attached to a *Mopsea*-stem, the base of the *Actinia* being closed around the stem; similar forms dredged frequently elsewhere in deep water, attached to Alcyonarian-stems, *Hyalonema*-spicules, &c.); *A. gelatinosa*, sp. n., *id. l. c.* p. 298, fig. 6 (attached in a similar way to a dead Gorgonid between Bapda and Amboina).

Paractis erythrosoma (Ehrbg.), Klunzinger (6), p. 69, pl. viii. fig. 6; *adhærens* (Ehrbg.), *ibid.*, pl. viii. fig. 4; *olivacea* (Ehrbg.), p. 70, pls. v. fig. 7, viii. fig. 8; *pulchella* (Ehrbg.), p. 71, pl. vii. fig. 4; *erythrea* (Ehrbg.), pl. viii. fig. 7; *medusula*, sp. n., pl. v. fig. 6; *hemprichi*, sp. n., p. 72, pl. viii. fig. 5 (Red Sea).

Corynactis globulifera (Ehrbg.), *id. l. c.* p. 73, pl. v. fig. 8; *quadricolor* (Leuck.), *ibid.* (Red Sea).

Phellia decora (Ehrbg.), *id. l. c.* p. 74, pls. v. fig. 3, vii. fig. 5 (Red Sea); *tubicola*, sp. n., Koren & Danielssen (8) p. 77, pl. ix. figs. 1 & 2 (near Bergen, 200 fathoms); *abyssicola*, sp. n., *id. l. c.* p. 78, pl. ix. figs. 3 & 4 (near Bergen, on pebbles, 250 fathoms).

Calliactis polyopus (Forsk.), Klunzinger, *l. c.* p. 76, pl. v. fig. 1 (Red Sea).

Bunodes crista (Ehrbg.), *id. l. c.* p. 77, pl. viii. fig. 1; *koseirensis*, sp. n., *id. l. c.* pl. vi. figs. 1 & 2; *stellula* (Ehrbg.), *id. l. c.* p. 78, pl. v. fig. 4 (Red Sea).

Thelactis, g. n., Klunzinger (subfamily *Bunodidae*). Body-wall with a single transversal series of conical warts. *T. simplex*, sp. n., *id. l. c.* p. 79, pl. vi. fig. 5 (Red Sea; perhaps a young stage of something else).

Peachia teniata, sp. n., *id. l. c.* p. 81, pl. v. fig. 5 (Red Sea).

Edwardsia pudica, sp. n., *id. l. c.* p. 80, pl. v. fig. 3; *arenosa*, sp. n., *id. l. c.* p. 81 (Red Sea); *coriacea*, sp. n., Moseley (10), p. 299, pl. xlv. figs. 11–14 (off Cape St. Vincent, 600 fathoms).

Cerianthus bathymetricus, sp. n., Moseley, *l. c.* p. 302, pl. xlv. figs. 15–20 (between Bermuda and Azores, 2750 fathoms); *loydi*, Koren & Danielssen, Fauna litt. Norv., pl. iv. figs. 8 & 9.

Discosoma nummiforme, Leuck., Klunzinger, *l. c.* p. 82, pl. vi. fig. 6; *tapetum*, (Ehrbg.), *id. l. c.* p. 83; *giganteum* (Forsk.), *id. pl. v.* fig. 2 (Red Sea).

Heteranthus, g. n., Klunzinger (subf. *Discosomidae*). Periphery of disk provided with short conical, the central portion with wart-like, tentacles, forming radiating zones; body, especially above, with adhesive wart-like suckers, margin of disk with many warted lobules; tentacles and disk almost quite retractile. *H. verruculatus*, sp. n., *id. l. c.* p. 84, pl. v. fig. 9 (Red Sea).

Triactis, g. n., *id.* (subf. *Phyllactiniæ*). Margin of disk with branched tentacles, enclosing 2–3 rows of very short ones, most of which have globular tips; the highly protractile and retractile portion of the disk with numerous thin, threadlike ones; body smooth, without warts. *T. producta*, sp. n., *id. l. c.* p. 85, pl. vi. fig. 8 (Red Sea).

Cryptodendrum, g. n., *id.* (subf. *Phyllactiniæ*). Disk densely covered by very short tentacles; the peripheral cycles and those of the large

central portion ramified, the intermediate cycles simple, adhesive. *C. adhasivum*, sp. n., *id. l. c.* p. 86, pl. v. fig. 4 (Red Sea).

Phymanthus loligo, Ehrbg.; *id. l. c.* p. 87, pls. vi. figs. 1-7, vii. fig. 31 (Red Sea).

Rhodactis rhodostoma, Ehrbg.; *id. l. c.* p. 88, pl. viii. fig. 3 (Red Sea).

Thalassianthus aster, Leuck. (*Epicladia quadrangula*, Ehrbg.); *id. l. c.* p. 89 (Red Sea).

Heterodactyla hemprichi, Ehrbg.; *id. l. c.* p. 90, pl. vii. fig. 1 (Red Sea).

Actineria hemprichi, Ehrbg.; *id. l. c.* pl. vii. fig. 2 (Red Sea).

(ZOANTHIDÆ.) *Zoanthus norvegicus*, sp. n., Koren & Danielssen (8), p. 79, pl. ix. figs. 5 & 6 (near Bergen, 300 fathoms, on corals, *Tethea*, Lima, &c.); *Z. bertholleti* (Aud.) (*Hughea savignii*, Ehrbg., pt.); Klunzinger (6), p. 63; *perii* (And.), *id. l. c.* p. 64, pl. iv. fig. 6 (Red Sea).

Palythoa lesueurii, Aud. (*Mamillifera fuliginosa*, Ehrbg., *Hughea savignii*, Ehr., pt., *H. hemprichi*, Ehr., *Palythoa savignii*, Hæck.), Klunzinger, *l. c.* p. 64; *tuberculosa* (Esper) (*Alcyon. papillosum*, Pall. ?, *flavo-viridis*, argus, Ehrbg.), *id. l. c.* p. 66, pl. iv. fig. 7 (Red Sea). In the last-named species, proper calcareous corpuscles were detected in the skin.

Panceria, g. n., Andres. Cœnecium in juventute tantum existens, saxi adnatum, tenue, parvum, expansum; polypi liberi erecti; pariete corporis crassa; tentaculis biserialibus; peristomo parvo, veloque carente; lamellis mesentericis inferne lobatis, varioque modo coalescentibus. *P. spongiosa*, sp. n., *id.* (1), Port Natal (calcareous crystalline deposits in the mesoderm).

(TURBINOLIDÆ.) *Caryophyllia ? pourtalesi*, Dunc., Lindström (9), p. 8, pl. i. fig. 4 (= *Paracyathus thulensis*, Gosse ?) (N.W. Atlantic, 53° 34' N. lat., 52° 1' W. long., and off Azores, 100-980 fathoms).

Leptocyathus ? stimpsoni, Pourt., *id. l. c.* p. 9, pl. i. figs. 5-8 (off Azores and Josephine Bank, 200-600 fathoms); *L. ? halianthus*, sp. n., *id. l. c.* pl. i. fig. 9 (off Cape Frio, 30 fathoms).

Paracyathus arcuatus, sp. n., *id. l. c.* p. 10, pl. i. figs. 10-12 (Josephine Bank and off Punta Delgada, 50-112 fathoms).

Bathycyathus elegans, sp. n., Studer (12), p. 628, pl. i. fig. 1.

Deltoocyathus agassizi, Pourt., Lindström (9) *l. c.* p. 10, pls. i. & ii. figs. 13-20 (= *Sabinotrochus apertus*, Dunc. ?, and *Trochocyathus rawsoni*, Pourt. ?) (Antillean Sea, Josephine Bank, off Azores, 110-600 fathoms). Figured in "The Atlantic," i. pp. 271 & 269.

Trochocyathus coronatus, Pourt.; "The Atlantic," i. p. 266.

Ceratotrochus diadema, Mosel.; *op. cit.* ii. p. 122.

Desmophyllum gracile, sp. n., Studer (12), p. 629, pl. i. fig. 2 (34° 99 lat. S., 172° 35' 8 long. E., 90 fathoms).

Sphenotrochus auritus, Pourt., var., Lindström (9), p. 11, pl. ii. figs. 21 & 22 (Antillean Sea, shallow water).

Flabellum latum, sp. n., Studer (12), p. 630, pl. i. fig. 3 (34° 16' 8 lat. S. 172° 59' 6 long. E., 45 fathoms); *martensi*, sp. n., *id. l. c.* (East coast of Australia, 76 fathoms). With *F. laciniatum*, Phil. Lindström (9), p. 12, identifies the forms described as *Ulocyathus arcticus*, *Flabellum macandrewi*, Gr., and *alabastrum*, Mosel. ["The Atlantic," ii. p. 51]. *F. apertum* and *angulare* (pentagonal, quinary), Mos.; *op. cit.* ii. p. 345.

Duncania barbadensis, Pourt., does not belong to the "*Rugosa*;" primary

septa 6; Lindström, *l. c.* p. 13. (De Koninck's "*Duncania*" is probably a *Zaphrentis*).

Schizocyathus fissilis, Pourt., Lindström, *l. c.* p. 15, pls. ii. & iii. figs. 26-29 (Antillean Sea, West Atlantic Ocean, 200-790 fathoms). Dissolves into segments when attaining a certain size, the segments being partly utilized by the old regenerating polypite or by new budding ones.

Stenocyathus vermiformis, Pourt.; *id. l. c.* p. 19, pl. iii. figs. 35 & 36 (Antillean Sea, Josephine Bank, 200-320 fathoms).

According to Studer (12), *Celosmilia fecunda*, Pourt. (*l. c.* p. 641, pls. i. & ii. fig. 9), belongs to the *Cladocoracea*, and is the type of a new genus, *Anomacora*. On the other hand, Lindström (9, p. 21), refers this species and the genus *Cenosmilia* of Pourtales, to *Parasmilia*. *P. (?) punctata*, sp. n., Lindström, *l. c.* pl. iii. figs. 37 & 38 (Anguilla, 200 fathoms).

(*MUSSACEÆ*). Brüggemann (3, pp. 300-313) published a critical synopsis of the species of *Scolymia* Haime (= *Lithophyllia*), adding *S. vitiensis*, sp. n. (Fiji Islands).

Cynarina, g. n., Brüggemann (3); agreeing in all respects with *Scolymia*, except that the coral is free when adult, turbinate, and covered with a thick opitheca. *C. savignii*, sp. n. (Red Sea, figured in the "Description de l'Égypte").

Trachyphyllia geoffroyi, M. E. & Haime, is described as a species of *Antillia*; *A. constricta*, sp. n. (Borneo): Brüggemann, *l. c.*

Homophyllia, g. n., *id. l. c.*, differing from *Antillia* through the small trabecular columella, from *Scolymia* through the denticulate, not roughly spinous costæ, &c. Type *Caryophylla australis*, M. E. & Haime (Port Lincoln).

Remarks on the relations of *Isophyllia*, *Symphyllia*, and *Ulophyllia*; *id. l. c.*

(*ASTRÆACEÆ*) *Plesiastrea hækeli*, sp. n., *id.* (2), p. 396, pl. vii. fig. 2 (Red Sea).

Cyphastrea capitata, sp. n., Studer (12), p. 639 (New Hanover).

(*ASTRANGIACEÆ*) *Phyllangia papuensis*, sp. n., *id. l. c.* p. 642 (Solomon Archipelago, 48 fathoms).

(*OCULINIDÆ*) *Lophohelia tubulosa*, sp. n., *id. l. c.* p. 631, pl. i. fig. 8 (W. of Büjoga Islands, 150 fathoms).

(*STYLOPHORIDÆ*) *Stylophora sinaitica*, sp. n. (Häckel), Brüggemann (2), p. 396, pl. vii. fig. 3 (Red Sea).

(*POCILLOPORIDÆ*) Critical remarks on the species of *Seriatopora*; *id.* (3), pp. 417-421. *S. pacifica* (Fiji Islands), *guentheri* (New Guinea), and *stricta* (Cape of Good Hope), spp. nn.

Pocillopora mauritiana, sp. n., *id.* (2), p. 399, pl. vii. fig. 4 (Mauritius).

(*ECHINOPORIDÆ*) *Echinopora striatula*, sp. n., Studer (12), p. 644, pl. iii. fig. 10 (Galewo Strait, New Britannia).

Madracis asperula, figured in "The Atlantic," i. p. 360.

(*TURBINARIIDÆ*) *Turbinaria bifrons* and *Astræopora expansa*, spp. nn., Brüggemann (3), p. 415-417 (hab. unknown). Critical remarks on other species.

(*DENDROPHYLLIDÆ*) *Dendrophyllia* (*Balanophyllia*) *goesi*, sp. n., Lindström (9), p. 24, pl. iii. figs. 40–42 (St. Martin, 40–150 fathoms). (Observations on the order of appearance of the septa; the primary septa are arrested in their development and shut in by the secondary ones, &c.) *D. granosa*, sp. n., Studer (12), p. 653 (W Australia, 50 fathoms).

(*FUNGIIDÆ*) *Lophoseris repens*, sp. n., Brüggemann (2) (Red Sea).

Pachyseris involuta, sp. n., Studer (12), p. 644, pl. iii. fig. 11.

Diaseris crispa, Pourt., Lindström (9), p. 23, pl. iii. fig. 30 (Antillean Sea, Josephine Bank, Azores, etc., 200–550 fathoms).

Fungia actiniformis, Q. G., Studer, l. c. p. 648, pls. iii. & iv. fig. 12; *acutidens*, sp. n., id. l. c. p. 649, pl. iv. fig. 13 (New Ireland); *carcharias*, sp. n., id. l. c. pl. iv. fig. 14 (Solomon Archipelago); *plana*, sp. n., id. l. c. p. 650, pl. iv. fig. 15 (New Britain); *pliculosa*, sp. n., id. l. c. p. 651 (Solomon Archipelago). *F. symmetrica*, Pourt.; "The Atlantic," ii. pp. 149–151.

(*PORITIDÆ*) *Montipora incrustans*, sp. n., Brüggemann (2), p. 399 (Mauritius).

(*MADREPORIDÆ*) *Madrepora scherzeriana*, sp. n. (Häckel), id. l. c. p. 397; pl. viii. (Red Sea).

A list of specimens of Corals in the Hunterian Museum, figured in Ellis's and Solander's "Natural History of Zoophytes"; J. Young, Ann. N. H. (4) xix. p. 116.

(*ANTIPATHIDÆ*) *Antipathes anguina*, Dana (*spiralis*, Pall. ?), Klunzinger (6), p. 60; *isidis-plocamos*, Ehrbg. (*compressa*, Ehr., pt.), id. l. c. p. 61, pl. iv. fig. 5 (Red Sea).

(*GORGONIIDÆ*) *Calyptraphora josephinae*, sp. n., Lindström (9), p. 6, pl. i. figs. 1–3 (36° 46' lat. N., 14° 7' long. W., 110–117 fathoms).

Plexaura antipathes, L. (*dubia*, Köll.), Klunzinger (6), p. 51, pl. iv. fig. 1; *torta*, sp. n., id. l. c. p. 52, pl. iii. fig. 10 (Red Sea).

The sub-family *Ceratolithophyta* of Klunzinger (6) comprises the *Plexauridae*, *Primnoaceae*, and *Gorgonellaceae*.

Verrucella flexuosa (Lmk.) ; id. l. c. p. 54, pl. iv. fig. 2 (Red Sea).

Juncella gemmacea (Val.), id. l. c. p. 55; *hepatica*, sp. n., id. l. c. pl. iv. fig. 3 (Red Sea).

Mopsea erythraea, Ehrbg.; id. l. c. p. 57, pl. vi. fig. 4 (Red Sea).

(*SIPHONOGORGACEÆ*) *Siphonogorgia mirabilis*, sp. n., id. l. c. p. 49, pl. iii. fig. 9 (Red Sea).

(*PENNATULIDÆ*). Koren & Danielssen's Synopsis of the Norwegian Sea-pens (8 B) enumerates 10 genera and 19 species (or distinct varieties) of "*Pennatulæ penniformes*," "*Virgulariæ*," and "*Kophobelemmonia*." [On the characters of the new genera, cf. Zool. Rec. xi. p. 522]. They describe and figure:—*Ptilella grandis*, Ehrbg., p. 82, pl. xi. figs. 1–7; *Pennatula aculeata*, K. D., p. 86, pl. xi. figs. 8 & 9, var. *rosea*, p. 88; *distorta*, K. D., p. 89, pl. xi. figs. 10 & 11; *phosphorea*, var. *variegata*, p. 90; *Virgularia affinis*, K. D., p. 90, pl. iv. figs. 1–7; *Dubenia*, g. n. [= *Batea*, olim], *abyssicola*, K. D., p. 94, pls. x. & xii. figs. 1–3; var. *smaragdina*, p. 96, pl. x. figs. 7 & 8; *elegans*, Dan., p. 97, pl. iii. figs. 1–7; *Lygomorpha sarsi*, K. D., p. 99, pl. ix. figs. 7–12; *Cladiscus gracilis*, K. D., p. 101, pl. ix. figs. 13–15.

Umbellularia grænlandica (L.) figured; "The Atlantic," i. p. 150.

(ALCYONIIDÆ.) The *Alcyoninae* are divided by Klunzinger (6) into "*A. retractiles*" (*Alcyonium*, *Sarcophytum*), "*capituliferae*" (*Ammothea*, *Nephthya*, *Spongodes*), and "*exserta*" (*Xenia*).

Alcyonium sphaerophorum (Ehrbg.), Klunzinger, l. c. p. 22, pl. i. fig. 1; *globuliferum*, sp. n., id. l. c. p. 23, pl. i. fig. 2; *digitulatum*, sp. n., id. l. c. p. 24, pl. i. fig. 3; *pachyclados*, sp. n., id. l. c. pl. i. fig. 5; *brachyclados* (Ehrbg.), id. l. c. p. 25, pl. i. fig. 4 (= *tuberculosum*, Q. G.); *polydactylum* (Ehrbg.), id. l. c. p. 26, pl. i. fig. 6; *leptoclados* (Ehrbg.) l. c. pl. i. fig. 7; *gyrosus*, sp. n., id. p. 27, pl. ii. fig. 1 (Red Sea). *A. fruticosum*, M. Sars, Faun. littor. Norv. iii. p. 81, pl. iii. fig. 8.

Sarcophytum pulmo, Esper (= *lobatum*, Less.), Klunzinger, l. c. p. 281, pl. i. fig. 8; *pauciflorum* (Ehrbg.) (= *Lithophytum pulmonare*, Forsk.), id. p. 29, pl. ii. fig. 2; *S. (?) savignii*, Klz. (= *Ammothea virescens*, Aud., *Ammocella pauciflora*, Gr.), id. l. c. p. 30 (Red Sea).

Ammothea thyrsoidea (Ehrbg.), id. l. c. p. 31, pl. ii. fig. 3; *arboorea* (Forsk.) (*virescens*, Sav., *Nephthya cordieri*, Aud.), id. l. c. pl. ii. fig. 4 (Red Sea); *luetkeni*, Marenzeller, Denk. Ak. Wien, xxxv. p. 16, pl. iii. fig. i. (North Polar Sea). (This is the Greenland Alcyonarian referred by the late M. Sars, l. c. p. 81, to *Alcyonium fruticosum*).

Gersemia, g. n., Marenzeller. Zoanthodema erect, ramified, or tuberos and unbranched; polypites cylindrical, well developed, with the abdominal portion rather elongate, not retractile or only partly so: sarcosoma slightly developed; no spicules in the septa; body wall of the polypite, tentacles, and pinnules richly studded with spicules. *G. florida*, Rathke (Zool. Dan.), id. l. c. p. 19, pl. iii. fig. 2 (North Polar Sea, 186-240 mètres); *loricata*, sp. n., id. l. c. p. 21, pl. iii. fig. 3 (North Polar Sea, 183-203 mètres).

Nephthya chabroli (Aud.) (*innominata*, *savignii*, Blv.), Klunzinger (6) p. 33, pl. ii. fig. 5 (Red Sea).

Spongodes savignii (Ehrbg.), Klunzinger, l. c. p. 35, pl. ii. fig. 6; *hemprichi*, Klz., id. l. c. p. 36, pl. iii. fig. 1 (*N. florida*, Ehrbg., *S. celosia*, Less.); *ramulosa*, Gr., id. l. c. p. 37, pl. iii. fig. 2 (Red Sea).

Xenia umbellata, Sav., id. l. c. p. 39, pl. iii. fig. 3; *fuscescens*, Ehrbg., id. l. c. p. 41 (? *Heteroxenia elizabetha*, Köll.); var. *minor* (*X. cerulea*, Ehrbg.) (Red Sea).

Sympodium ceruleum, Ehrbg., id. l. c. p. 42, pl. iii. fig. 5; *fulvum* (Forsk.), id. l. c. p. 43, pl. iii. fig. 6; *fuliginosum*, Ehrbg., id. l. c. pl. iii. fig. 7; *purpurascens*, Ehrbg., id. l. c. p. 44, pl. iii. fig. 8 (Red Sea).

Anthelia glauca, Sav., id. l. c. p. 45; *strumosa*, Ehrbg., id. l. c. (Red Sea).

(TUBIPORIDÆ.) *Tubipora hemprichi*, Ehrbg., id. l. c. p. 47, pl. v. fig. 10; *purpurea*, Pall. (*musica*, Sol., Ell.), id. l. c. p. 48, pl. v. fig. 11 (Red Sea).

FOSSIL CORALS.

W. DYBOWSKY, Die Chætétiden der ostbaltischen Silurformation, St. Petersburg, 134 pp., 6 pls. (new genera, *Dillopora* and *Solenopora*). H. A.

NICHOLSON & R. ETHERIDGE, jun., Contributions to Micropalæontology :
 1. On the genus *Tetradium*, Dana, and on a British species of the same.
 2. On *Prasopora grayæ*, a new genus and species of silurian corals : Ann. N. H. (4) xx. pp. 161-169, 388-392. Notes on the genus *Alveolites*, Lamarck, and on some allied forms of palæozoic corals ; J. L. S. xiii. pp. 353-370, pls. xix. & xx. C. A. WHITE describes 2 Devonian and 1 Subcarboniferous species of corals ; P. Ac. Philad. 1876, pp. 27 & 28. J. L. NEUGEBORN, Systematisches Verzeichniss der in den Miocenschichten bei Ober-Lapugy in Siebenbürgen vorkommenden fossilen Korallen ; Verh. siebenb. Ver. xxxvii. p. 41 (cited after JB. Geol. Reichsanst., 1877). — FROMENTEL, Paléontologie Française, Zoophytes ; Terrain Crétacé, livr. 27 [feuilles 28-30, pls. cix.-cxx.]. J. YOUNG, On Turbinated Corals from Cunningham Bedland, Dalry ; P. N. H. S. Glasgow, iii. p. 163.

HYDROZOA.

1. ALLMAN, G. J. Report on the *Hydroida* collected during the exploration of the Gulf Stream. Mem. Mus. C. Z. v. 2, 66 pp., 34 pls.
 2. CARTER, H. J. On the close relationship of *Hydractinia*, *Parkeria*, and *Stomatopora*, with descriptions of new species of the former, both recent and fossil. Ann. N. H. (4) xix. pp. 44-76, pl. viii.
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 4. CLAUS, C. Mittheilungen über die Siphonophoren- und Medusen-Fauna Triests. Verh. z.-b. Wien, xxvi. pp. 7-11.
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[A posthumous paper, written years ago.]
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GENERALITIES.

EIMER's note (6) on the artificial divisibility and the nervous system of *Medusæ* is the precursor of an elaborate memoir, and can therefore here only be recorded provisionally. The nervous system is evidently analogous to that in *Beroë*, as demonstrated by the same author [Zool. Rec. x. p. 515]; it is a differentiation of the ectoderm and its dependencies, increasing in strength in certain regions, especially towards the margin of the disk, either in its whole circumference (*Geryoniidæ*), or particularly in the vicinity of the marginal corpuscles (*Acraspedota*).

CLAUS (4) enumerates some of the *Medusaria*, *Siphonophora*, and *Ctenophora* of Trieste, characterizing shortly some new genera (*vide infra*). The Hydroids recorded as being from Iceland [Zool. Rec. xi. p. 527] were probably collected in Davis Straits, off Frederikshaab, Greenland, in 100 fathoms (HINCKS, 9, B); a few Hydroids from Reykjavik Harbour are noticed. Five species of Hydroids are noticed in MARENZELLER's account of arctic *Radiata* and *Vermes* (*vide supra*, p. 8). 24 Californian and Vancouver-Island species are enumerated by CLARK (3). SPAGNOLINI (17) catalogues the *Siphonophora* and craspedote *Medusæ* of the Mediterranean, with notes on their occurrence. Among the 71 species of Hydroids dredged between Florida and Cuba (1), the large majority (64) were new, and several belong to new generic combinations: 9 gymnoblastic and 56 calyptoblastic species (10 *Campanulariidae*, 17 *Sertulariidae*, and 28 *Plumulariidae*).

From an analysis of the skeleton of *Hydractinia echinata*, of a new species with calcareous skeleton, and of some tertiary and cretaceous species, and a comparison of these structures with that of the fossil forms known as *Parkeria*, *Loftusia*, *Stromatopora*, and a species from the chalk described as *Bradya tergestina*, Stache, CARTER (2) arrives at the result that "all this chain of evidence seems to lead to the conclusion, that the whole of these organisms, both recent and fossil, were species of *Hydrozoa*, and neither *Foraminifera* nor Sponges."

STEGANOPHTHALMOUS OR PHANEROCARPIC (ACRASPEDOTE) MEDUSÆ.

CLAUS (5) has studied the structure and evolution of the so-termed "*Scyphistoma*" of *Chrysaora* and *Aurelia*. In the "*Morula*"-stage the embryo is formed of a single cell-layer; the endoderm of the "*Gastrula*" is formed through invagination from one of the poles, but this orifice is again completely closed and only re-opened afterwards, through the formation of the true mouth at a later stage, at the same place, after the fixation of the "*Planula*"-larva by the broader (hitherto anterior) extremity. The attached portion is little by little drawn out into a stem-like foot, which secretes cuticular layers, forming a horny tube analogous to that of other fixed *Hydrozoa*. After the appearance of the first two (not absolutely contemporaneous) tentacles, two others will appear, forming the four tentacles of the first order; "*Ephyra*" or *Medusæ* with abnormal (diminished or enlarged) number of radii may be referred to irregularities (retardations or accelerations) in the development of the tentacles of the "nurse." In the direction of the four tentacles of the second order, four muscular strings are developed (analogous to those of *Lucernaria* ♀), and four folds or ribs, projecting into the gastral cavity. Between the endoderm and ectoderm a fluid mesodermal-layer is interposed, corresponding to the gelatinous layer of *Medusæ*, and only exceptionally taking the character of a "hyaline lamella"; it is also present in the gastral protuberances, which are not radial vessels; a circular canal does not exist. Cnidoblasts are present in great number also in the endoderm. During the transformation of the *Scyphistoma* into a column of "*Ephyra*" (*Strobila*), the gastral ribs—by means of which and of the stomachal tube the young *Acalephs* are kept temporarily together—correspond with the four primary ventral filaments of the "*Ephyra*." This therefore has four secondary radii, corresponding with the filaments and the genital sacs; four primary radii, corresponding with the four angles of the buccal cross and the four arms, and eight intermediary radii, answering to the eight primary marginal tentacles and the simple not ramified, radial vessels. The author maintains that the transformation of the *Acaleph-nurse* into the so-termed "*Strobila*" is a true transversal division, not a masked gemmation; but here more details would appear requisite before doing away with the observations of authors who have upheld the latter view.

Claus has further (*l. c.*) studied the evolution and structure of *Aurelia*, *Chrysaora*, and *Rhizostoma*. The four so-termed "genital sacs" of *Aurelia* (wanting in *Pelagidæ* and *Rhizostomidæ*, being replaced by the

gastral cavity itself) are dilations of the stomach, in whose inferior wall, separating them from the sub-genital cavities, the ovaries and spermaries are developed from the endoderm; the sexual products are carried away, normally through the mouth; and the four sub-genital cavities (scarcely developed in *Chrysaora*, wanting in the new genus *Discomedusa*, but developed again in *Rhizostomide*) have no intimate relation with the organs of generation, being perhaps properly respiratory in their principal function. The marginal corpuscle is an eye (at least an organ for the perception of light), but the hood-like lobe covering it contains a peculiar (olfactory ?) organ of sense; nervous elements (fibrils and ganglionic cells) are present in the immediate vicinity of this organ, in the pedicle of the corpuscle, at its base, in the ocular sinus, as a double ganglion; they are also found in the transversely striated muscles of the marginal zone of the disk, while the non-striated muscular elements of the arms and tentacles have the character of ectodermal "neuro-muscular" cells; the theory of the ambiguous character of these elements is however contested and restricted within its proper limits; the same cell may be differentiated into one of the two (nervous or contractile), but not into both. Cnidoblasts are not only found in the ectoderm, also in the endoderm, e.g. the gastral filaments. The hermaphroditism of *Chrysaora* (at least in certain seasons) is confirmed, but not entirely cleared up. Claus found small males, large and middle-sized hermaphrodites, and large females, showing vestiges of previous hermaphroditism; the spermaries are developed from the endoderm, in small or larger vesicles, on the inside of the arms and stomach, on the gastral filaments and the gastro-genital membrane, &c.

The author finally discusses the relations of *Lucernaria*, *Charybdea*, and *Ægina* with the true discophorous Acalephs (*Medusæ* with gastral filaments), and arrives at the conclusion that the *Æginidæ* are true *Hydromedusæ*, while the *Lucernariidæ* and *Charybdeidæ* should be arranged with the *Acalephæ* (*Monostomeæ* and *Rhizostomeæ*) as primary divisions of this sub-class, viz., *Cylicoza* and *Lobophora*.

Nausithoe, Köll., is upheld as a good but imperfectly known genus. *Melanaster* and *Polybostricha* are not different from *Chrysaora*. A new genus is introduced as *Discomedusa*, type of a new family intermediate between the *Aureliidæ*, *Pelagidæ*, and *Rhizostomidæ*. Disk flattish; four single fimbriated arms; mouth wide; no special gastro-genital sacs; sub-genital cavities also wanting; sexes distinct; organs of generation forming a simple, almost closed ring. Margin of disk and tentacles (twenty-four) as in the *Pelagidæ*; eight ramifying and anastomosing (ocular) radial canals, and eight simple (tentacular) vessels, sometimes united by a few branches with the vascular net, all of equal length and united by the circular canal. Differs from *Aurelia* in the want of gastro-genital and sub-genital cavities, the shape of the genital bands, the number and non-dorsal development of the tentacles and consequently the want of a "velum"; and in the margin of the disk not being formed through the development of intermediary lobes, but through subdivision of the primary *Ephyra*-lobes. *D. lobata*, sp. n. (pp. 11 & 42-47, pls. viii. & ix.), Trieste.

Thecomedusæ. The enigmatical "hydroid zooids of sponges" described by Eimer [Zool. Rec. ix. pp. 476 & 477] are satisfactorily explained through Schulze's description of *Spongicola fistularis*, g. & sp. n. (16), a commensalist of various Mediterranean sponges (*Spongia*, *Myxilla*, *Esperia*, *Suberites*, *Reniera*), nearly allied to (identical with?) Allman's *Stephanocyphus*, but differing through the less regular annulation of the perisarc, the presence of a hypostome, the absence of a circular canal, and the existence of four internal, longitudinal ribs (productions of the hyaline lamella, invested with endoderm) in place of the four vessels described in *Stephanocyphus*. This Hydrozoon is also nearly related to the "*Scyphistoma*" of *Discomedusæ* (on the true structure of which some remarks are adduced). With reference to histology, the demonstration of an external longitudinal layer of true muscular cells, and the apparent presence of a layer of circular muscles inside the "hyaline lamella," are especially noticeable.

CYLICOZOA (LUCERNARIIDÆ).

TASCHENBERG (18) reduces the Clarkian genera and species to the previously known 5 species and 2 genera: *Depastrum cyathiforme* (Sars), *Lucernaria quadricornis* (Müll.), *campanulata*, Lmk., *auricula*, Fabr., *octo-radiata*, Lmk., and *leuckarti*, sp. n. (the species from Heligoland, described by Mettenheimer). The species are easily distinguished (1) by the insertion of the tentacles on the margin of the disk or on eight arms, (2) the single or quadruple cavity of the stem, (3) the presence or absence of four muscular strings in the stem, and (4) of large or small marginal corpuscles (modified tentacles), &c. The group is characterized thus:—"Cup-shaped Medusarins, fixed at the dorsal pole through a stem-like foot, and wearing at the superior free margin the tentacles, which are commonly grouped together in clusters. The mouth-tube, which protrudes freely at the centre of the ventral surface, leads into the central gastral cavity, which, at the base of the cup, communicates with the four wide radial canals. Sexes distinct; sexual products developing as eight plaited bands in the walls of four genital sacs, excavated into the ventral aspect of the cup." Errors of previous investigators (Clark, Korotneff*) are pointed out, but in several of these points, *e. g.*, the abolition of the difference between the *Clistocarpidae* and *Eleutherocarpidae* of Clark, the author is himself afterwards corrected by Claus (5); the genital organs in reality belong to the radial canals. The anatomy and histology of *L. leuckarti* is fully worked out. The gelatinous layer between endoderm and ectoderm is characterized as mesoderm; in this layer the muscles are placed (eight internal, radiating; eight external, marginal); the sexual products also penetrate into the mesoderm, but are formed from the ectoderm. The gastral tentacles are compared with those of certain jelly-fishes and with the mesenterial filaments of *Actinia*; no sense

* A paper (Russian) of this author is cited, "Attempt at a comparative study of the *Coelenterata*. I. *Lucernaria*, and its systematic position." Moscow (1876). Izv. Liab. Est. Antr. Etno. xviii. Known to the Recorder from Taschenberg's and Claus's abstracts only.

organs and no special nervous system were detected; Korotneff's interpretations [Zool. Rec. xiii.] are corrected accordingly. The existence of orifices connecting the four gastro-vascular chambers, and representing the circular vessel of jelly-fishes, is also denied.

HYDROCORALLIA.

Cryptohelia virginis, sp. n., Lindström, *l. c.* p. 14, pl. ii. fig. 24 (off Salt Island, 200–320 fathoms. *C. pudica* figured; "The Atlantic," i. p. 272.

Stylaster levis, sp. n., Studer, *l. c.* p. 635, pl. ii. fig. 5 (N. of Three Kings Island, 90 fathoms); *verrucosus*, sp. n., *id.* *l. c.* pl. ii. fig. 6 (597 fathoms) (a *Eunice* is established in the cavity of the polyparium, as in *Cryptohelia pudica*); *obliquus*, sp. n., *id.* *l. c.* pl. ii. fig. 7 (with *S. levis*).

According to the detailed investigations of MOSELEY (11), the only living portion of the corallum of *Millepora* is the superficial part, consisting of a ramified "hydrophyton" with anastomosing branches, in the interstices of which the calcareous matter is deposited, probably from the ectoderm. The "tabulæ" of the calicles correspond with the successive layers of the corallum formed during growth. [The characters of the two kinds of zooids are given in Zool. Rec. xiii. *Cæl.* p. 10]. A membranous lamella separates the ectodermal layer from the endodermal; the former is more or less studded with nematocysts of two kinds, those composing the tentacular knobs being of the kind most characteristic of the *Hydrozoa*; the endodermal cells are of two kinds, large pigmented cells, to which the yellow colour of the corallum is due, and smaller transparent globules, predominating in the deeper parts of the living "hydrophyton." In the superior portion of the mouthed zooids the endodermal cells take the character of "gastric" cells. Longitudinal muscles are seen inside the lamella in the zooids, radiating into the branches of the hydrophyton communicating with them. There was also seen an appearance of a set of circular fibres lying externally to the longitudinal, but likewise on the inside of the membrane. *Hydractinia*, *Podocoryne*, and *Gemmaria* are the forms of ordinary *Hydrozoa* offering, in different ways, the most resemblance to *Millepora*.

SIPHONOPHORA.

Physophora borealis, Sars, described and analysed in detail; Fauna littor. Norvegiæ, iii. p. 32, pls. v. & vi. figs. 1–8.

Halistemma tergestinum, sp. n., Claus (4) (Trieste).

J. H. MORTIMER, Notes on *Physalia*; P. Liverp. Soc. xxi. pp. lxxv.–lxxvii.

ATHECATA (GYMNOBLASTICA) AND ALLIED GYMNOPTHALMIC (CRASPEDOTE) MEDUSÆ.

Perigonimus (?) *nutans*, sp. n., Hincks (9), p. 149, pl. xii. fig. 1 (gonophores unknown).

Podocoryne carnea, Sars; *id.* *l. c.* p. 150, pl. xii. figs. 7 & 8. Observa-

tions on the spiral and filamentary appendages; the spiral ones are, apparently, as in *Hydractinia*, only present in mature individuals.

Note on *Acharadria larynx*; *id. l. c. p. 151.*

Rhizoragium roseum, Sars [Zool. Rec. x. p. 513], Fauna Littor. Norv. iii. p. 28, pl. iv. figs. 37 & 38.

Myriothele phrygia (Fabr.), Sars, *l. c. p. 23*, pl. ii. figs. 29-36. Specifically, perhaps generically, different from the species examined by Hincks and Allman, viz.: *Spadix cockesi*, Vig., [cf. Zool. Rec. x. p. 513]. The principal differences are the entirely naked hydranth, without any investment by a perisac, but fixed through stolon-like filaments, and the single or clustered sac-like gonophores, containing embryos of the same character as in the British form. (The characters of the Arctic form will, however, probably require a revision with reference to the remarkable structures lately demonstrated in the British species).

Hydractinia calcarea, sp. n., Carter (2), p. 50, pl. viii. figs. 4-6 (calcareous! on shells habited by hermit crabs, Cape Palmas); *H. pliocena*, Allm., and a cretaceous species, *H. vicarii*, sp. n. (*l. c. p. 53*, pl. viii. fig. 11), are also described.

Oo[r]rhiza, g. n., Mereschkowsky (10), provisionally announced, allied to *Podocoryne* and *Hydractinia*, distinguished by having sporosacs with a single ovum, rising immediately from the hydrorhiza, without the introduction of a blastostyle.

Tubularia elegans, sp. n., Clark (3), p. 253, pl. xxxviii. fig. 2 (California).

Corymorpha nutans, Sars, F. litt. Norv. iii. p. 2, pl. ii. figs. 25-28; *sarsi*, Stp., p. 4, pls. ii. figs. 18-24, & iv. figs. 9-23; *annulicornis*, Sars, p. 8, pl. i. figs. 7-13; *glacialis*, Sars, p. 11, pls. i. figs. 14-22, & ii. figs. 1-7. (All previously recorded and described Norwegian species; characters chiefly from the gonosome.)

Stenstrupia globosa, Sars, *l. c. p. 20*, pl. i. figs. 1-6; perhaps the gonosome of a *Corymorpha*. *S. lineata*, Leuck., figured by Spagnolini, pl. i. figs. 1-4, as are likewise *Sarsia pulchella*, Forb. (*l. c. pl. ii. figs. 1 & 2*), *Dipurena dolichogaster*, Häck. (pl. ii. fig. 3), *Oceania pileata*, Pér. (pl. iii. figs. 1 & 2) (also by Claus, pl. xi. figs. 46 & 47), and *flavidula*, Pér. (pl. iii. figs. 1 & 2); *Eleutheria dichotoma* (pl. iv. fig. 2).

Monobranchus, g. n., Mereschkowsky. Hydrocaulus not developed, hydranth cylindrical, truncated above, with a single filiform tentacle; mouth central, without lobes; gonophores without blastostyles; medusiform planoblasts, with four radiating canals, sixteen tentacles, and eight generative sacs, two from each radiating canal; hydrorhiza consisting of a continuous expansion, not composed of a mass of anastomosing stolonice tubes. *M. parasitus*, sp. n., *id.* (10) (White Sea, on *Tellina*-shells).

Bimeria humilis, sp. n., Allman (1), p. 8, pl. v. figs. 3 & 4 (Tortugas); *p. gracilis*, sp. n., Clark (3), p. 252, pl. xxxviii. fig. 3 (California).

Eudendrium eximium, sp. n., Allman, *l. c. p. 6*, pl. i. figs. 1 & 2 (off Florida Reef, 43 fathoms); *exiguum*, sp. n., *id. l. c. pl. ii. figs. 1 & 2* (off Key West, 135 fathoms); *attenuatum*, sp. n., *id. l. c. pl. ii. figs. 3 & 4* (off Tortugas, 60 fathoms); *laxum*, sp. n., *id. l. c. p. 7*, pl. iii. (off Sand Key, 100 fathoms); *gracile*, sp. n., *id. l. c. pl. iv. figs. 1 & 2* (Shot Key, 3-4

fathoms); *tenellum*, sp. n., *id. l. c.* p. 8, pl. iv. figs. 3 & 4 (Shot Key, 471 fathoms); *cochleatum*, sp. n., *id. l. c.* pl. v. figs. 1 & 2 (Cape Fear River, 6 fathoms). *E. sp.*, Clark (3), p. 253, pl. xxxviii. fig. 3 (California).

Liriopsis, g. n. (*Geryonidarum*), Claus (4). Radial canals four; eight tentacles of equal length, no lingual cone, and no centripetal canal; the elongate sexual organs continued from the peduncle, only interrupted by a free space, to the margin of the disk; eight marginal vesicles between the eight tentacles. *L. campanulata*, sp. n., p. 11 (Trieste).

Rhopalonema velatum, Ggb., figured by Spagnolini (17), pl. vi. figs. 3-5.

THECAPHORA (CALYPTOBLASTICA) AND ALLIED GYMNOPTHALMIC (CRASPEDOTE) MEDUSÆ.

Medusæ figured by Spagnolini (17): *Thaumantias* (*Cosmetira punctata*, Hæck. ♀), pl. iv. fig. 1, *Phialidium ferrugineum*, Hæck. (pl. v. figs. 1 & 2), *viridicans*, Leuck., pl. v. figs. 3-6, and *Obelia gymnoptalma*, Péron (pl. vi. figs. 1 & 2).

Obelia marginata, sp. n., Allman (11), *l. c.* p. 9, pl. vi. figs. 1 & 2 (Loggerhead Key, 9 fathoms); *longicyathus*, sp. n., *id. l. c.* p. 10, pl. vii. figs. 4 & 5 (off Florida Reef, 90 fathoms).

Thyroscyphus, g. n. (*Campanulidarum*), *id. l. c.* Hydrocaulus divided into internodes, each carrying a pedunculate hydrotheca, whose orifice is closed by an operculum formed by four converging valves (gonosome unknown). *T. ramosus*, sp. n., *id. l. c.* p. 11, pl. vi. figs. 5 & 6 (Sand Key, 10 fathoms).

Campanularia macroscypha, sp. n., *id. l. c.* pl. viii. figs. 1 & 2 (Sand Key), 120 fathoms); *evarta*, sp. n., Clark (3), p. 253, pl. xxxix. fig. 4 (California); *cylindrica*, sp. n., *id. l. c.* p. 254, pl. xxxix. fig. 1, *fusiformis*, sp. n., *id. l. c.* fig. 2 (California and Vancouver Island).

On the probable occurrence of *Lafoeina tenuis*, Sars, on British coasts; Hincks (9), p. 152.

Lafoea venusta, sp. n., Allman, *l. c.* pl. v. fig. 3 (Loggerhead Key, 9 fathoms), *tenellula*, sp. n., *id. l. c.* p. 12, pl. viii. figs. 3 & 4 (Marquesas, 140 fathoms), *coalescens*, sp. n., *id. l. c.* p. 13, pl. x. (Marquesas), *convallaria*, sp. n., *id. l. c.* p. 12, pl. ix (Florida Reef, 152 fathoms).

Cuspidella pedunculata, sp. n., *id. l. c.* p. 13, pl. viii. figs. 5 & 6 (Tortugas, 260 fathoms).

[*H*] *Oplo[r]rhiza*, g. n. (*Lafoeinarum*), *id. l. c.* Hydrothecæ tubular, provided with a flow and having the orifice cut into thin collapsible segments; borne by peduncles, which spring from a creeping network of tubes; hydrorhizal network carrying tubular receptacles with an orifice in the summit, and enclosing a granular fleshy column, supporting a cluster of thread cells. (Gonosome unknown). *O. parvula*, sp. n., *id. l. c.* p. 15, pl. vii. figs. 1-3 (Marquesas, 296 fathoms).

Halecium filicula, sp. n., *id. l. c.* pl. xi. figs. 1-4 (Marquesas, 140 fathoms), *capillare* (Pourt.), *id. l. c.* p. 16, pl. xi. figs. 5 & 6, *macrocephalum*, sp. n., *id. ibid.*, pl. xii. figs. 1-5 (Sand Key, 120 fathoms); *H. tenellum*, Hæck., Clark (3), pl. xxxix. fig. 5 (California).

Polyserias hincksi and *glacialis*, Mereschowsky (10), p. 228, pl. vi. figs. 15 & 16, provisionally announced as a new genus of *Sertulariidae*; hydrothecæ in six or more rows.

Cryptolaria conferta, sp. n., Allman (1), p. 17, pl. xii. figs. 6-10 (off Cuba, 450 fathoms), *longitheca*, sp. n., *id. l. c.* p. 19, pl. xiii. figs. 4 & 5 (Shot Key, 315 fathoms), *abies*, sp. n., *id. l. c.* p. 20, pl. xiii. figs. 1-3, *elegans*, sp. n., *id. ibid.*, pl. xiv. figs. 1 & 2 (Florida Reef, 152 fathoms).

Sertularella conica, sp. n., *id. l. c.* p. 21, pl. xv. figs. 6 & 7 (off Tortugas, 60 fathoms), *amphorifera*, sp. n., *id. l. c.* p. 22, pl. xv. figs. 8-10, (Shot Key, 471 fathoms), *gayi*, var. *robusta*, *ibid.*, pl. xv. figs. 3-5; *S. turrida* (Trask), Clark (3), p. 259, pl. xxxviii. figs. 4 & 5.

Sertularia marginata, sp. n., Allman (1), p. 23, pl. xvi. figs. 1 & 2 (off Florida Reef, 324 fathoms), *tumida*, sp. n., *id. ibid.*, pl. xvi. figs. 3 & 4 (Tortugas), *tubitheca*, *id. l. c.* p. 24, pl. xvi. figs. 5 & 6 (Tortugas, 16 fathoms), *exigua*, sp. n., *id. ibid.*, pl. xvi. figs. 7 & 8 (Cape Fear, 9 fathoms), *distans*, sp. n., *id. l. c.* p. 25, pl. xvi. figs. 9 & 10 (Tennessee Reef, 21 fathoms); *S. anguina*, Trask, Clark (3), p. 255, pl. xl. figs. 1 & 2, var. *robusta*, p. 256, pl. xl. figs. 3-5 (California, Vancouver Island), *greenii*, Murr., p. 257, pl. xxxviii. fig. 6, *furcata*, Trask, p. 258, pl. xxxix. fig. 3.

Desmoscyphus longitheca, sp. n., Allman, *l. c.* p. 26, pl. xiv. figs. 3-6 (Key West).

Plumularia franciscana, Trask, is a *Hydrallmania*; Clark (3), p. 260.

Thuiaria distans, sp. n., Allman (1), p. 27, pl. xvii. figs. 1 & 2 (Tortugas); *plumulifera*, sp. n., *id. l. c.* pl. xvii. figs. 3-6 (Cape Fear, 9 fathoms); *pinnata*, sp. n., *id. l. c.* p. 28, pl. xv. figs. 1 & 2 (Shot Key, 3-4 fathoms); *sertularioides*, sp. n., *id. l. c.* pl. xvi. figs. 11 & 12.

Plumularia siliquosa, sp. n., Hincks (9), p. 148, pl. xii. figs. 2-6 (Guernsey; only known in its simple, non-plumose stage); *filicula*, sp. n., Allman (1), p. 29, pl. xviii. figs. 1 & 2 (Alligator Reef, 88 fathoms); *macrotheca*, sp. n., *id. l. c.* p. 30, pl. xviii. figs. 3 & 4 (off Cuba, 450 fathoms); *attenuata*, sp. n., *id. l. c.* pl. xviii. figs. 5 & 6 (off Bocca Grande, 105 fathoms); *megalocephala*, sp. n., *id. l. c.* p. 31, pl. xix. figs. 1 & 2 (Alligator Reef, 14 fathoms); *geminata*, sp. n., *id. l. c.* p. 32, pl. xx. figs. 1-4 (Sand Key, 120 fathoms); *P. setacea* (Lmk.), Clark (3), p. 261, pl. xli. figs. 1 & 2.

Halopteris, g. n., Allman (*Plumulariidarum*). Hydrosome pinnate-plumose; stem and pinnæ divided into internodes; hydrothecæ unilateral, adnate to side of pinnæ, flanked by a pair of nematophores, adnate to them, one on each side; mesial nematophores 2 (or more), not adnate to the hydrotheca, fixed, monothalamic, with an oblique aperture continued into a lateral slit (gonosome unknown). *H. carinata*, sp. n., *id. l. c.* p. 33, pl. xix. figs. 3-7 (Carysfort Reef, 35 fathoms).

Antennularia simplex, sp. n., *id. l. c.* p. 34, pl. xxi. figs. 1 & 2 (Alligator Reef, 86 fathoms).

Antennopsis, g. n. (*Plumul.*), *id.* Stem jointed, sending off scattered jointed ramuli, which carry the hydrothecæ; these are unilateral, with entire margin, associated with a pair of moveable supracalcine nematophores and with moveable azygous nematophores borne along the hydro-

thecal side of the ramuli; gonangia not protected by corbulæ or other appendages. *A. hippuris*, sp. n., *id. l. c.* p. 35, pl. xxi. figs. 3-6 (Shot Key, 195 fathoms).

Hippurella, g. n. (*Plumul.*), *id.* Hydrocaulus branched, ultimate ramuli pinnate on the proximal portion of the branches, but distributed on all sides towards their distal extremities; hydrothecæ borne on the ultimate ramuli, unilateral, with entire margin, associated with a pair of supracalcine nematophores, and with azygous nematophores along the hydrothecal side of the ramulus (gonosome unknown). *H. annulata*, sp. n., *id. l. c.* p. 36, pl. xxi. figs. 7 & 8 (Pacific Reef, 283 fathoms).

Monostechas, g. n. (*Plumul.*), *id.* Stem branched; hydrothecal ramuli confined to one side of their supporting branches; hydrothecæ unilateral, with entire margin, associated with a pair of supracalcine nematophores, and with free mesial nematophores; gonangia not contained in corbulæ, or connected with special branches. *M. dichotoma*, sp. n., *id. l. c.* p. 37, pl. xxii. figs. 1-5 (Pacific Reef).

Antenella, g. n. (*Plumul.*), *id.* Hydrocaulus consisting of simple stems, which spring from a congeries of tubular filaments; stems divided into internodes, destitute of pinnæ, and directly bearing the hydrothecæ, whose margin is entire; nematophores free and moveable (gonosome unknown). *A. gracilis*, sp. n., *id. l. c.* p. 38, pl. xxii. figs. 6 & 7 (Carysfort Reef, 60 fathoms).

Aglaophenia ramosa, sp. n., *id. l. c.* p. 39, pl. xxiii. figs. 1-4 (Florida Reef, 2-3 fathoms); *rhynchocarpa*, sp. n., *id. l. c.* p. 40, pl. xxiii. figs. 5-8 (Key West, 3-4 fathoms); *lophocarpa*, sp. n., *id. l. c.* p. 41, pl. xxiv. figs. 1-4 (Tortugas, 68 fathoms); *apocarpa*, sp. n., *id. l. c.* p. 42, pl. xxv. figs. 1-4 (Carysfort Reef, 52 fathoms); *gracilis*, sp. n., *id. l. c.* p. 43, pl. xxv. figs. 5-9 (Cape Fear, 9 fathoms); *distans*, sp. n., *id. l. c.* p. 44, pl. xxvi. figs. 1-8 (Pacific Reef, 283 fathoms); *sigma*, sp. n., *id. l. c.* p. 45, pl. xxvi. figs. 9 & 10 (Alligator Reef, 110 fathoms); *bispinosa*, sp. n., *id. l. c.* p. 46, pls. xxvii. & xxviii. (Alligator and Tennessee Reefs, 156-200 fathoms); *constricta*, sp. n., *id. l. c.* p. 47, pl. xxix. figs. 1-4 (Conch Reef, 30 fathoms); *perpusilla*, sp. n., *id. l. c.* p. 48, pl. xxix. figs. 5-7 (Quicksands, 34 fathoms); *late-carinata*, sp. n., *id. l. c.* p. 56 (Mexican Gulf, on gulfweed). *A. struthionides* (Murr.), Clark (3), p. 262, pl. xli. fig. 3.

Cladocarpus dolichotheca, sp. n., Allman (1), p. 50, pl. xxx. (Pacific Reef, 283 fathoms); *ventricosus*, sp. n., *id. l. c.* p. 52, pl. xxxi. (Sand Key, 100 fathoms); *paradisea*, sp. n., *id. l. c.* p. 53, pls. xxxii. & xxxiii. (off Tennessee Reef and Samboes, 123-174 fathoms).

Halicornaria speciosa, sp. n., *id. l. c.* p. 54, pl. xxxiv. (Shot Key, 4-5 fathoms).

GRAPTOLITES.

W. SWANSTON, Graptolites, with special reference to those found in County Down; P. Belf. Club (2) i. p. 115 *et seq.* J. YOUNG, On Graptolites from Silurian Strata of the Girvan Valley; P. N. H. Soc. Glasg. ii. p. 182 *et seq.* G. H. MORTON, On the Graptolites found in the Lower Llandilo Strata, &c.; P. Liverp. G. Soc. iii. p. 296 *et seq.*

SPONGIDA.

BY

STUART O. RIDLEY, B.A.

LIST OF PAPERS PUBLISHED ON RECENT SPONGES.

1. BOWERBANK, J. S (The late). Description of Five New Sponges, discovered by Dr. A. B. Meyer on the Philippine Islands and New Guinea. P. Z. S. 1877, p. 456.
2. CARTER, H. J. On two Vitreo-hexactinellid Sponges. Ann. N. H. (4) xix. p. 121, pl. ix.
3. ——. Arctic and Antarctic Sponges, &c. *Op. cit.* xx. p. 38, pl. i.
4. ——. Description of *Mauricea*, a Psammonematous Sponge (mentioned incidentally). *Tom. cit.* p. 174.
5. FULLAGAR, —. Note on the development of the Spicules of *Spongilla fluviatilis*. Sci. Goss. June, 1877 ; and M. Micr. Journ. xviii. p. 45.
6. GREMMA, E. O. Description of new Sponges discovered during his Aral and Caspian researches. Aralo-Caspian Researches, vol. ii. (St. Petersburg. In Russian.) (a) Tetrad i. 1876, p. 80, pls. ii. & iii. (parts); (b) Tetrad 2, 1877, p. 29, pl. ix. figs. 1-6.
7. HIGGIN, T. Description of some Sponges obtained during a cruise of the steam yacht *Argo*, &c. Ann. N. H. (4) xix. p. 291, pl. xiv.
8. HYATT, A. Revision of the North American *Porifera*; with remarks upon foreign species. Part ii. Mem. Bost. Soc. ii. p. 481, pls. xv., xvi., & xvii. (photographs).
9. ——. On the Embryology of Sponges. P. Bost. Soc. xix. p. 12.
10. KELLER, C. Remarks on Three Layers in Sponges. Verh. Ges. Zurich, 1875-76, p. 68.
11. KENT, W. SAVILLE. Note in Ann. N. H. (4) xx. p. 448, on *Hali-physema*.
12. MURIE, J. On Steere's Sponge (a new genus of the Hexactinellid group of the *Spongida*. Tr. L. S. (2) i. pp. 219-234, pls. xxxvi. & xxxvii. (With Appendix by H. J. Carter.)

2 Spong.

SPONGIDA.

13. PAYER, JULIUS. Incidental notice of occurrence of *Hyalonemata*. Austrian Arctic Voyage. London: 1876. Vol. ii. p. 93, & fig.
14. SCHMIDT, E. OSCAR. Das Larven-Stadium von *Ascetta primordialis* und *Ascetta clathrus*. Arch. mikr. Anat. xiv. p. 249, pls. xv. & xvi.
15. SCHUFFNER, OSCAR. Beschreibung einiger neuer Kalkschwämme. Jen. Z. Nat. xi. p. 403, pls. xxiv., xxv., & xxvi.
16. SCHULZE, F. E. Untersuchungen ueber den Bau und die Entwicklung der Spongien; Die Gattung *Halisarca*. Z. wiss. Zool. xxviii. p. 1, pls.
17. ——. Untersuchungen, &c.; Die Familie der *Chondrosidæ*. Op. cit. xxix. p. 87, pls. viii. & ix.
18. SMITH, S. I., & HARGER, O. Report on the Dredgings in the region of St. George's Banks in 1872. Tr. Conn. Acad. iii. [1874] p. 55, pl. vii. fig. 1.
19. SOLLAS, W. J. On the Changes produced in the Siliceous Skeletons of certain Sponges by the action of Caustic Potash. Ann. N. H. (4) xx. p. 285, pl. ix.
20. WALLER, J. G. On a new British Sponge of the genus *Microciona*. M. Micr. Journ. xviii. p. 261.
21. WRIGHT, E. P. On a new Genus and Species of Sponge [*Kallispongia archeri*]. P. R. Irish Ac. (2) ii. pp. 754–756, pl. xl.
22. ZITTEL, KARL A. Studies on Fossil Sponges. I. *Hexactinellida*. Ann. N. H. (4) xx. pp. 257, 405, & 501; Translated from Abh. bayer. Ak. (2 Cl.) xiii.* pp. 1–63.

Cf. also PASCOE's "Zoological Classification" (London: 1877), pp. 10–12, for characters of chief groups, and list of families and chief genera.

GENERA, SPECIES, &C., REFERRED TO.

Order CARNOSA.

Halisarca lobularis, Schmidt, (16) p. 1, figured. Anatomy minutely described (also the development, *vide infra*). It includes six colour varieties (named *carulea*, *violacea*, *rubra*, *purpurea*, *brunnea*, *pallida*), which may prove to be species. Is best recognized by its velvety surface and ear-like marginal appendages. The egg-capsules lie in the mesoderm. Consists mainly of a chambered dermal layer and a basal 'beam network.' Is probably identical with *Chondrosia tuberculata*, Sdt. Sexes divided among different individuals.

Halisarca dujardini, Johnst., (16) figured. Structure described; no "beam-net" tissue; ectoderm unciliated; mesoderm traversed by fibres.

* Zittel's 'Studien über fossile Spongien. Erste Abtheilung, i. *Hexactinellida*,' was published in the first part of vol. xiii. Abh. bayer. Ak., bearing date 1878.—ED.

Corticium abyssi (3). Spicules found in Smith's Sound sand (Cape Napoleon), 50 fathoms.

Fam. *Chondrosiidae* (17) ; species enumerated and described : —

Chondrosia reniformis, Nardo (p. 97, pl. viii.). Has concretions, apparently adipose, in the cortex. Minute anatomy carefully described.

Chondrilla nucula, Sdt. (p. 108, pl. ix. figs. 11–18). Also presents the apparently adipose masses.

Chondrosia gliricauda, Sdt. (p. 114). Probably a variety of *C. reniformis*.

Chondrosia plebeja, Sdt. (p. 115), described.

Gummina wallichi, Cart. Not to be reckoned a Gumminean under its present characters.

Columnitis, Sdt. (p. 118), to be removed, and placed near *Tethya*.

Cellulophana pileata, Sdt. (p. 119). A compound Ascidian.

Lacinia stellifica, Selenka (p. 121). A compound Ascidian.

Two new species of *Chondrilla* (vide *infra*).

Orders CERATINA and PSAMMONEMATA (Carter).

HYATT (8) elaborately describes the genera and species (with numerous "sub-species") of "sub-order *Sponginae*," so far as they have come under his observation. He states his belief that the Sponges form a distinct sub-kingdom by themselves.

"Sub-order SPONGINÆ." No large axial tube to fibre ; fibre-coats fibrillated.

Fam. 1—*Spongiidae*.

Gen. *Spongia*, Auct. (*Euspongia*, Bronn, *Caccospongia*, Sdt.).

Species—*Spongia officinalis*, Linn., *S. discus*, Duch. & Mich., *S. lignea*, Hy., *S. graminea*, Hy., *S. equina*, Sdt., *S. agaricina*, Pall., *S. vermiculata*, Duch. & Mich., *S. lapidescens*, Duch. & Mich. (all with "sub species" and named and figured varieties).

Spongia otahitica, Esper, to be placed with *Carteriospongia*, *infra*.

Gen. *Stelospongos*, Sdt.

Species—*Stelospongos maynardi*, Hy., *S. laevis*, Hy., *S. friabilis*, Hy., *S. pikii*, Hy., *S. intertextus*, Hy.

Gen. *Spongelia*, Nardo (*Spongionella*, Bk., *Dysidea*, J., pt., *Caccospongia*, Sdt., pt.). Distinguished from *Spongia* when dry by the honeycombed surface set with woolly pile of projecting fibres. Foreign materials absent from secondary fibres.

Species—*Spongelia incerta*, Hy., *Sp. velata*, Hy., *Sp. dubia*, Hy., *Sp. cana*, Hy., *Sp. spinosa*, Hy., *Sp. farlovii*, Hy., *Sp. rectilinea*, Hy., *Sp. palmata*, Hy., *Sp. enormis*, Hy., *Sp. anceps*, Hy., *Sp. ligneana*, Hy., *Sp. kirkii*, Hy.

Fam. 2—*Phyllospongiidae*. Stocks frondose, anastomosing ; fibres generally radiate from axial mesh-like mass, and differ from those of *Spongiadae* by freedom of secondary fibres from foreign bodies.

Gen. *Carteriospongia*, g. n. (*vide infra*).

Gen. *Phyllospongia*, Ehlers, *Ph. papyracea*, Ehlers.

Fam. 3. *Hirciniidae*. Fibres gelatinous ; forms like *Spongiidae*.

Gen. *Dysidea*, Johnst. (*Spongelia*, Sdt., pt.), *D. fragilis*, Johnst.

Hircinia, Nardo, (*Filifera*, &c.). The "*Spongiophaga*" of Carter is probably parasitic. *H. campana*, N., *H. arbusculum*, sp. n. (*vide infra*) *H. acuta*, Hy., *H. cartilaginea*, Hy., *H. purpurea*, Hy.

Fam. 4. *Ceratellidae*, Gray.

Gen. *Ceratella*, Gray, and *Dihitella*, Gray, are undoubtedly the same genus. *C. labyrinthica*, sp. n. (*vide infra*).

Hyatt considers the fistular adult forms of the *Spongiidae* as homologous with a number of the embryonic cloacæ which have become laterally fused (*cf.* Hæckel). He gives a careful account of the varieties, and relations to depth and temperature, of the species above-named. Development (*vide infra*). Many of the species are figured.

Tuba perhaps belongs to the *Spongiine*.

Haliphysema (11). Apparently a Sponge; the simplest form of the group, each individual representing a "ciliated chamber."

Order *HOLORRHAPHIDOTA* (Carter).

Sollas (19) gives the results of his experiments on the spicules of the following:—

Halichondria incrustans and *H. panicea*.

Trachya sp., *Pachymatisma johnstonia*, *Geodia arabica*, and of some Hexactinellids, which give interesting and suggestive facts as to the development and typical structure, and as to the changes wrought in fossil forms and recent spicules, at the sea-bottom.

Thecophora ibla, W. Th., (18) taken in 50–60 fathoms, on St. George's Banks, North America (*cf.* p. 55, & pl. vii. fig. 1).

Spongilla fluviatilis, Johnst., (5) p. 45. The smooth acerate spicules develop from centrally inflated forms.

Wyvillethomsonia, Wright, (14) referred to *Stelletta*.

Discodermia polydiscus, Boc. Figured in Sollas's paper on *Siphonia* (*cf.* fossil forms, *infra*).

Order *HEXACTINELLIDA*.

Zittel (22) revises the whole of the recent and fossil genera. He states his belief of the entire distinctness of the group from the Lithistids and all others, and puts forward the following classification of the group, based mainly on microscopic characters:—

Suborder *Lyssakina* [-ac-], Zittel. Forms in which the skeleton-spicules generally remain united by sarcodæ only (= *Sarcohexactinellidae*, Carter, with *Euplectella aspergillum* and *E. cucumer*).

Suborder *Dictyonina*, Zittel. Forms with the skeleton-spicules regularly coalescent into latticework with angular meshes. He regards the form of the crossing-nodes as an important classificatory point.

Minor divisions:—I. *DICTYONINA*. Fam. 1. *Astylospongiæ*. Unstalked body, very thick walled; system of canals radiating from centre to surface; framework irregular; nodes solid.

(Genera, *Astylospongia*, Röm., *Paleomanon*, Röm., *Protachilleum*, Zitt., *Eospongia*, Billings; diagnoses given)

Fam. 2. *Euretidae*. Cup-shaped; skeleton latticed; nodes imperforate: surface fundamentally naked.

(Genera, ? *Protospongia*, Salter, *Calathium*, Billings, *Archæocyathus*, Billings, ? *Trachyum*, Billings, ? *Steganodictyon*, McCoy, *Tremadictyon*, g.n.)

(vide infra), *Craticularia*, g. n., ? *Eubrochus*, Sollas, *Sphenaulax*, g. n., *Sporadopyle*, g. n., *Sclerothamnus*, Marsh., *Farrea*, Bowb., *Eurete*, Marsh., *Verrucocelia*, Etallon, *Aulodictyon*, Kent).

Fam. 3. *Coscinoporidæ*.

(Genera, ? *Bothroconis*, King, *Leptophragma*, g. n., *Pleurostoma*, Röm., *Guettardia*, Mich., *Coscinopora*, Goldf.)

Fam. 4. *Mellitionidæ*.

(Genera, *Aphrocallistes*, Gray, ? *Fieldingia*, Kent, *Stauronema*, Sollas.)

Fam. 5. *Ventriculitidæ*.

(Genera, *Pachyteichisma* [-ti-], g. n., *Trochobolus*, g. n., *Ventriculites*, Mantell, *Schizo[r]rhabdus*, g. n., *Tretostamnia*, Pomel; *Rhizopoterion*, g. n., *Sporadoscinia*, Pomel (emend. Zittel); *Licmosinion*, Pomel, *Polyblastidium*, g. n., *Cephalites*, Toulm. Smith (pt.); *Lepidospongia*, Röm.)

Fam. 6. *Staurodermidæ*.

(Genera, *Cypellia*, Pom., *Stauroderma*, g. n., *Porocypellia*, Pom., *Cassearia*, Quenst., *Porospongia*, D'Orb., *Ophrystoma*, g. n., ? *Placochlenia*, Pom.)

Fam. 7. *Mæandrospongiida*, Zitt.

(Genera, *Plocoscyphia*, Reuss., *Dactylocalyx*, Stutchb., *Periphragella*, Marsh., *Myliusia*, Gray, pt., *Tremabolites*, g. n., *Etheridgia*, Tate, *Toulminia*, g. n., *Camerospongia*, D'Orb., *Cystispongia*, Röm.)

Fam. 8. *Callodictyonidæ*.

(Genera, *Callodictyon*, g. n., *Marshallia*, g. n., *Becksia*, Schlüt., *Pleurope*, g. n., *Diplodictyon*, g. n.)

Fam. 9. *Cæloptychiidæ*.

(Genus, *Cæloptychium*, Goldf.)

II. LYSSAKINA.

Fam. 1. *Monacidæ*.

(Genera, *Acanthospongia*, McCoy, *Stauractinella*, g. n., ? *Acestra*, Röm.)

Fam. 2. *Plionacidæ*.

(Genera, *Asconema*, Kent, *Lanuginella*, Sdt.)

Fam. 3. *Pollacidæ*.

(Genera, *Holtenia*, Sdt., *Pheronema*, Leidy, *Crateromorpha*, Gr., *Rosella*, Cart., *Sympagella*, Sdt., *Placodictyon*, Sdt., *Euplectella*, Owen, *Habrodictyon*, W. Th., *Labaria*, Gr., *Meyerina*, Gr., = *Semperella*, Marsh., *Hyalonema*, Gr.)

Sollas (19), by experiments on *Dactylocalyx pumiceus*, *D. subglobosa*, *Myliusia callocyathes*, *Farrea*, and *Aphrocallistes*, elucidates facts as to their original spicule structure. Some spicules appear capitate instead of plain.

Myliusia grayi, Bk., (2) p. 126, pl. ix. figs. 8-17. Figured, with its structures, for the first time. The peculiar fibre-nodes distinguish it from *M. callocyathes* and connect it with *Ventriculites*, &c.

Sclerothamnus clausi, Marsh. (12). Redescribed and well figured as *Dendrospongia steerii*, Murie (p. 220, and pls.), from the Philippines, probably 70-100 fathoms. The indication of a "veil," the spinous fibres, and the scopuline and other spicules are pointed out.

Hyalonema longissimum, Sars, (18) p. 55. Taken in 430 fathoms, St.

George's Banks, North America; also (13) south of Franz Josef Land (p. 93).

Hyalonema boreale, Lov., (13) p. 93, figured, taken with the preceding. SOLLAS thus classifies the *Hexactinellida* (23, under fossil forms):—

I. *Stauroonemata*. Skeleton spicule rectangular.

1. A. *Furrea*. Simple nodes; skeleton one layer thick.

B. *Stauroonema*. Simple nodes; skeleton several layers thick.

2. *Ventriculitida*. Octahedral lantern at nodes.

II. *Aphrocallistida*. Skeleton spicule-rays making any angles.

III. *Euplectellida*. Skeleton spicules cemented into ladder-like fibre.

Order CALCAREA.

Ascetia primordialis and *H. clathrus* (vide *infra*, under Development).

NEW (RECENT) GENERA AND SPECIES.

CARNOSA.

Chondrilla mixta, Red Sea, *distincta*, pl. ix. fig. 19, Ponapé, Schulze, (17), pp. 113 & 116.

CERATINA.

Halisporgia stellifera, Bowerbank (1), p. 460, Geelvink Bay, New Guinea.

PSAMMONEMATA.

Polyfibrospongia, Bowerbank (1). Differs from *Spongia* in the fasciculation of primary and secondary fibres into bundles, and in being Ectopsammonematous (i.e., in having the fibre externally encrusted). For *P. flabellifera*, p. 459, Geelvink Bay, New Guinea.

Carteriospongia, Hyatt (8), p. 540. Near *Phyllospongia*. Of frondose flabella, anastomosing to form a "head;" fibre like *Spongia*, arranged symmetrically. For *C. radiata*, p. 541, Zanzibar, Madagascar, *madagascarensis*, p. 542, Madagascar, *vermifera*, p. 542, *perforata*, p. 543, Philip's Island, Australia, and *C. (?) mystica*, p. 543 (perhaps *Spongia lignea*, Esper), Adelaide Is., South Australia.

Hircinia arbusculum, id. l. c. p. 548, Kingmsmill Islands.

Kallispongia [*Calli*], Wright (11). A stalked, inferiorly jointed, superiorly quadripartite, Crinoid-like form, of a reticulated horny substance (doubtful whether a sponge). For *K. archeri*, id. l. c. p. 754, pl. xl.; on *Delesseria*, Australia.

Mauricea, Carter (4). Agrees in outward structure with *Carteriospongia*, Hy. (vide *suprà*), but has the fibre coated in "ecto-psammonematous" fashion. *M. lacinulosa*, p. 174, Mauritius.

ECHINONEMATA.

Ophlitaspongia meyeri, Bowerbank (1), p. 456, Kordo, New Guinea.

Higginsia, Higgin (7), p. 291. Belongs to group *Pluriformia*, order *Echinonemata*, Cart.; skeleton and echinating spicules, smooth curved acerate; flesh spicules, spined acerate; flabelliform. For *H. coralloides*, id. *ibid.* pl. xiv. figs. 1-5, Grenada, W. Indies; also varr. *liberiensis*, Cape Palmas, and *arcuata*, Bantry Bay.

HOLORRHAPHIDOTA.

Isodictya aspera, Bowerbank (1), p. 458, Abu, Philippines.

Halichondria birotulata, Higgin (7), p. 296, pl. xiv. figs. 11–15. Very remarkable in possessing a minute birotulate spicule, resembling those of *Meyerina*; Caraccas and Jamaica.

Microciona bihamigera, Waller (20), p. 261, Torbay.

Amorphina caspia, Gremma (6*b*), p. 29, pl. ix. figs. 1 & 2, Caspian Sea.

Reniera flava, Gremma (6*a*), p. 80, pl. ii. figs. 11 & 12, pl. iii. fig. 1; cf. also (6*b*), p. 31, pl. ix. fig. 3.

Metschnikowia tuberculata, Gremma (6*b*), p. 31, pl. viii. fig. 17, pl. ix. fig. 4. Internally isodictyal, of short spined acerates; detached columns of spicula radiate from central mass. *M. intermedia*, id. (6*a*), p. 82, pl. ii. fig. 13; (6*b*) p. 37.

Semisuberites, Carter (3). A *Halichondria*, related to *Suberites*, Sdt., very closely by its smooth acuates and spinulates (these are subterminally inflated). *Sem. arctica*, p. 40, pl. i. fig. 1, Smith Sound, Cape Napoleon, 50 fathoms; Spitzbergen.

Donatia parasitica, Higgin (7), p. 294, pl. xiv. figs. 6–8. Remarkable for its stellates with dendritically-headed rays.

HEXACTINELLIDÆ.

Eurete farreopsis, Carter (2), p. 122, pl. ix. figs. 1–7. Like *Aphrocallistes beatrix*, but anastomosing; a remarkably capitate scopuline, and a four-ray branched rosette spicule, &c.; nodes of fibre microspined; Philippines.

Hyalonema anomalum, Bowerbank (1), p. 461. Distinguished from other *Hyalonemata* by the absence of a cord, and the presence of rosettes; Cebu.

CALCAREA.

Ascaltis compressa, Schuffner (15), p. 404, pl. xxv. fig. 9, Mauritius.

Ascandra tenuis, id. *l. c.* p. 406, pl. xxv. fig. 8, Hoidingsoe, Norway.

Leucaltis nausicaæ, p. 407, pl. xxiv. figs. 1 & 3, Corfu, *curva*, p. 409, pl. xxiv. fig. 2, Barbadoes; id. *l. c.*

Leucandra echinata, p. 411, pl. xxiv. fig. 4, *claviformis*, p. 414, pl. xxiv. fig. 5, and *falcigera*, p. 416, pl. xxv. fig. 6, Mauritius, *elongata*, p. 418, pl. xxv. fig. 7, Norway; id. *l. c.*

Sycortis sycilloides, id. *l. c.* p. 420, pl. xxv. fig. 10, Mauritius.

Sycandra tabulata, p. 422, pl. xxv. fig. 11, Mauritius, *quadrata*, p. 425, pl. xxvi. fig. 12, Mandal, Norway, *borealis*, p. 427, pl. xxvi. fig. 13, Hongsund, Norway, *barbadensis*, p. 429, pl. xxvi. fig. 14, Barbadoes; id. *l. c.*

GENERAL ANATOMY, DEVELOPMENT, &c.

Outward shape influenced by breeding-time in some cases (*Halisarca*) (16), owing to great development of a subjacent layer. Colour similarly affected.

"Dermis" in *Halisarca*, of fused ectoderm and endoderm (16) contains the ciliated chambers.

"Syncytium" found in *Halisarca dujardini* (16) with traces of cellular origin, lying on a flat-celled layer; no cilia; also in *Calcarea* (10 & 14), and *Chondrosia* (17).

Cellular outer layer in *Halisarca lobularis* (16).

Mesoderm tissue in *Halisarca* resembles *Medusa*-disk tissue (16); contains the ova and spermatozoa.

Fine canals in *Halisarca* lined with flat ciliated epithelium up to the ciliated chambers (16).

Sex: *Halisarca lobularis* is dioecious (16).

Spermatozoa developed in numbers, as fine knobbed thread-like bodies, in mother cells (16) in *H. lobularis*.

"Collar cells" essentially the same in *Halisarca* (16) as in Calci-sponges.

"Persons." Hyatt supports Hæckel as to the part which these, by multiplication and lateral fusion, play in the formation of the large *Ceratosa*; the "cloacæ" of the young being represented by various oscular passages (9).

Ovum:—After segmentation and formation of "planula" embryo, in *Ascetta* (14), some cells at the hinder pole become granular and push their way into the cleavage cavity, which closes; these endoderm cells may be merely scattered over the cavity, or accumulate at the lower end.

Ectoderm (14). The cells may have an outer transparent part in *Ascetta*, but this is no syncytium, and is probably only represented in adult by the syncytium, where present. Schulze (16) holds the adult superficial layer to represent it.

Germ-layers. Three probably, Schulze (16); this disputed by Keller (10).

Gastrula. Keller (10) considers an invaginate gastrula to be formed, with fusion of ectoderm into syncytium. Schmidt (14) denies formation of gastrula; the "amphiblastula" is reached by "shortened development." Hyatt (9) also denies it for the *Silicea* and *Ceratosa*.

Embryonic development results in a sessile form in *Ascetta* (14), with pseudopodiated outer membrane.

A stage in which one end is open occurs in some *Ceratosa* after the "morula" stage (9).

Spongia agrees in the main with *Chalina* and the *Halichondriida* (8) in development, but has no skeleton in early stages. It has a good basal collar and area.

FOSSIL SPONGES.

23. SOLLAS, W. J. On *Stauronema*, a new genus of Fossil Hexactinellid Sponges, &c. Ann. N. H. (4) xix. p. 1, pls. i.-v.
24. —. On *Pharetrospongia strahani*, Sollas, a Fossil Holorhaphidote Sponge, &c. J. Geol. Soc. xxxiii. p. 242, pl. xi.
25. YOUNG, J., & YOUNG, J. On a Carboniferous *Hyalonema* and other Sponges. Ann. N. H. (4) xx. p. 425, pls. xiv. & xv.

CARTER also refers to Young's *Hyalonema* in a preliminary note in Ann. N. H. (4) xx. p. 176. ZITTEL, in addition to his "Studies on Fossil Sponges" (22) reproduces part of these in JB. f. Mineral. 1877, p. 337, pls. ii.-v., giving at the same time some very good figures of the microscopic structure of more than twenty of the noticed species (e.g., *Trema-*

dictyon reticulatum, Goldf., *Pachytichisma carteri*, Zitt.). He also, l. c. p. 705, makes some remarks on Quenstedt's recent work on Sponges, criticising his genera, &c., and identifying some of his figures.

SOLLAS, in J. Geol. Soc. xxxiii. p. 790, pls. xxv. & xxvi., on the genus *Siphonia*, gives a full account of the literature of allied forms, and elaborate tables of the species which have been assigned to the genus; considers that they may be reduced to five (figured). They agree very closely with the recent Lithistid, *Discodermia polydiscus*, Boc. (figured).

NEW GENERA AND SPECIES.

Pharetrospongia strahani, Sollas (24), p. 242, pl. xi. Agrees with *Desmacidon* in having a regular fibre full of spicules; these are acerates. Coprolite bed, chalk marl, Cambridgeshire.

Haplistion, Young & Young (25), p. 428, pl. xv. figs. 31-37. Spheroidal. Skeleton of closely-set fibres; no spicules found. Carboniferous limestone, Cunningham Baidland.

Chlamys magna, iid. l. c. Apparently a Gumminean by its large eccentric stellates, the only remains found. Locality as preceding (probably not from a deep sea).

Hyalonema smithi, iid. l. c., is really the *Acanthospongia smithi* of authors (= *Serpula parallelum*, McCoy). Now considered a Sponge and a *Hyalonema* from its long anchoring spicules (smooth). Carboniferous limestone, Cunningham Baidland (p. 426, pl. xiv.).

Stauronema, Sollas (23). Resembles a cup-shaped *Farrea*, but with an oscular "veil"; carries cylindrical spined spicules (p. 1, pls. 1-5), wall several layers thick.

Callodictyon, id. l. c. Apparently a new name for *Stromatopora*, introduced as a Hexactinellid Sponge, among the *Aphrocallistidae*.

Zittel (22: the pagination is that of Abh. Bayer. Ak. xiii., but see note as to date), characterizes the following new genera, mainly from a microscopic examination of forms formerly known only by superficial characters:—

Tremadictyon, = part of *Spongites* and *Scyphia*. Large serial oscula on inner wall; meshes irregular; "veil" over wall (p. 46).

Craticularia. Differs from preceding by its cubical meshes (p. 46).

Sphenaulax. Differs from preceding by the meandric folds of the wall (p. 47).

Sporadopyle. Outer ostia scattered or in quincunx; rest as above (*Craticularia*), (p. 47).

Leptophragma. Wall thin; many small ostia; skeleton meshes irregular; nodes solid (p. 48).

Pachyteichisma [-ti-]. Meandric walls; ostia internal; meshes regular, with octahedral nodes (p. 49).

Trochobolus. As preceding, but wall nodulated (p. 50).

Schizo[r]hæbdus. Rod-like, laterally slit up, furrowed; rest as preceding (p. 51).

Rhizopoterion. Stalk branched; radial canals into stem; fibres with no axial canals (p. 51).

Polyblastidium. Polyzoic; perforated octahedral nodes; veil; no radial canals; isolated rod-like spicules (p. 52).

Stauroderma. Polyzoic; ostia on outer wall; skeleton irregular; veil (p. 53).

Ophrystoma. As *Porospongia*, D'Orb., but veil with axial crosses only, and nodes perforated (p. 55).

Tremabolites. Of anastomosing tubes or leaves; veil superior; octahedral nodes (p. 55).

Toulminia. Of thick meandric laminæ; root branched; veil as preceding (p. 56).

Callodictyon. Wall even; rectangular spined meshes; nodes perforated; no canals (p. 57).

Marshallia. As preceding; but walls folded, with apertures (p. 58).

Pleurope. Lateral apertures; bundles of fibres form base, and run over the rectangular meshes; nodes perforate (p. 58).

Diplodictyon. Broad, with round apertures; canals in outer layer only; outer layer with solid nodes; inner, with lantern-nodes (p. 59).

Stauractinella. Spherical; skeleton of isolated 6-radiates; nodes and arms hardly thickened anywhere (p. 60).

PROTOZOA.

BY

STUART O. RIDLEY, B.A.

RHIZOPODA, MONADS, FLAGELLATA.

LIST OF PAPERS ON RECENT FORMS.

1. ARCHER, W. (A) Résumé of Recent Contributions to our Knowledge of Freshwater *Rhizopoda*. Pt. iii., &c. Q. J. Micr. Sci. xvii. pp. 67, 107, 196, & 330, pls. viii., xiii., & xxi. (B) *Amphizonella violacea*, Greef. Note in *tom. cit.* p. 64.
2. BUCK, E. Einige Rhizopodenstudien. Z. wiss. Zool. xxx. p. 1, pls. i. & ii.
3. CARTER, H. J. Description of *Bdelloidina aggregata*, &c. Ann. N. H. (4) xix. p. 201, pl. xiii. figs. 1-8.
4. —. On the Locality of *Carpenteria balaniformis*, &c. *Tom. cit.* p. 209, pl. xiii. figs. 9-15. And note on *Carpenteria*, *op. cit.* xx., p. 68.
5. —. On a Melobesian form of *Foraminifera* (*Gypsina melobesoides*), &c. *Op. cit.* xx. p. 172.
6. —. Description of a new species of *Foraminifera* (*Rotalia spiculotesta*). *Tom. cit.* p. 470, pl. xvi.
7. —. On the close relationship of *Hydractinia*, *Parkeria*, and *Stromatopora*, &c. *Op. cit.* xix. p. 44, pl. viii.
8. ENTZ, G. Beitrag zur Kenntniss der Rhizopoden. Term. füzetek i. p. 185, pls. ix. & x. [*Cf.* also pp. 236 & 360, "Einige Wörter über marine Amöben."]
9. FRITSCH, —. Die Resultate einer Untersuchung des Hrn. K. Brandt über die Fortpflanzung von *Actinosphaerium eichhornii*, St. SB. nat. Fr. March, 1877. [Not seen by the Recorder.]
10. GEMMA, E. O. [*Protozoa* of his Aralo-Caspian Researches. Aralo-Caspian Researches (St. Petersburg)], tetrad i., p. 64, pls. i. & ii. (pt.).

11. HÄCKEL, E. *Bathybius* und die Moneren. Kosmos, 1877 (*vide infra*, in appendix to this list).
12. HERTWIG, R. (A) Studien über Rhizopoden. Jen. Z. Nat. xi. p. 324, pls. xix. & xx. (B) Ueber *Leptodiscus medusoides* (eine neue den Noctiluцен verwandte Flagellate). *Tom. cit.* p. 307, pls. xvii. & xviii.
13. HUXLEY, T. *Anatomy of the Invertebrata*. London: 1877.
14. LEIDY, J. Remarks upon Rhizopods, and notice of a new form. P. Ac. Philad. 1877, p. 293.
15. —. The Birth of a Rhizopod. *Tom. cit.* p. 261.
16. —. Remarks on the American species of *Diffugia*. *Tom. cit.* p. 306.
17. MAGGI, L. (A) Contribuzione alla morfologia delle Amphizonelle. Rend. Ist. Lomb. (2) x. p. 315, pl. ii. A. (B) Sulla natura morfologia dei *Distigma*. *Tom. cit.* p. 261. (C) Intorno all' incistamento del Proteo di Guanzati (*Amphileptus moniliger*, Ehrb., di Clap. e Lach.). *Tom. cit.* p. 227. (D) Sull' esistenza dei Moneri in Italia. *Tom. cit.* p. 360.
18. MÜLLER, — VAN. Ueber Fusulinen und aehnliche Foraminiferen-Formen des russischen Kohlenkalkes. JB. f. Mineral. 1877, p. 139 (woodcut).
19. NICHOLSON, H. ALLEYNE, & ETHERIDGE, R., JUN. On *Ascodictyon*, a new Provisional and Anomalous Genus of Palaeozoic Fossils. Ann. N. H. (4) xix. p. 463, pl. xix.
20. PARKER, W. K., & JONES, T. R. On *Ovulites margaritula*. Ann. N. H. (4) xx. p. 77.
21. SCHMANKJEWITSCH, G. W. Ueber den Zusammenhang der Salzseeform *Diselmis Dunalii* mit den Suss-wasser Monaden. Protocols of Assembly Russ. Natur. 1876, reported Z. wiss. Zool. xxviii. p. 400.
22. SOLLAS, W. J. On the perforate character of *Webbina*, with a notice of two new species, *W. laevis* and *W. tuberculata*, from the Cambridge Greensand. Geol. Mag. (n.s.) iv. p. 102, pl. vi.
23. TATEM, J. G. Note on Stein's genus *Hyalosphenia*. M. Micr. Journ. xvii. p. 311.
24. WALLICH, G. C. (A) On the fundamental error of constituting *Gromia* the type of Foraminiferal structure. Ann. N. H. (4) xix. p. 158; and Note on *Gromia*, *tom. cit.* p. 348. (B) Observations on the Coccosphere; *tom. cit.* p. 342, pl. xvii. (C) On *Rupertia stabilis*, a new form of sessile Foraminifer from the North Atlantic; *tom. cit.* p. 501, pl. xx.
25. WRIGHT, E. P. Notes on *Foraminifera*. Ann. N. H. (4) xix. p. 40.

The following papers also refer to the above subjects :—

“Recent Researches among some of the more simple Sarcodæ Organ-

isms" (ALLMAN, J. L. S. xviii. pp. 261 & 385), is a summary of the most important recent work among *Rhizopoda*, describing the chief species and the views of different writers upon them, with woodcuts.

Leidy, P. Ac. Philad. 1877, p. 321, notices the observation of *Diffugia cassis* and *globularis*, *Trinema acinus*, *Euglypha alveolata* and *brunnea*, in moss eight feet from the ground. On the feeding of *Dinamæba*; id. tom. cit. p. 288. Apparent discriminative power in the selection of food by a *Heliozoon*; id. tom. cit. p. 291. On *Chilomonas*; id. tom. cit. p. 198 (notices the finding of a species on the beach, Cape May, N. Jersey).

Myxastrum, perhaps a new species of, observed by E. P. Wright, at Howth, with marine *Algæ*; Q. J. Micr. Sci. xvii. p. 562.

Häckel revives the discussion of the nature of *Bathybius* in Kosmos (Zeitsch. f. Entwicklungslehre, &c., Leipzig), in his paper "*Bathybius und die Moneren*" (1877).

GENERA, SPECIES, &C., REFERRED TO.

Acanthocystis turfacea, Cart., (12) p. 334. Shows distinct superficial and "Mark" substances; a nucleus in the latter, with fine fibrils radiating from it to the superficial substance.

Acanthocystis aculeata, (12) p. 337, pl. xx. figs. 1-6. Gives the same results.

Actinolphus pedunculatus (12). The same in these structural points. This species described, (1) p. 72. It sometimes contains a capsule, with distinct plates, perhaps indicating encystation; the protoplasm then divides into halves.

Actinospharium (12). Shows the fibrils without the nucleus.

Actinospharium eichhorni is mentioned, and its structure, &c. (as given by him in 1873), recapitulated by Greef, in Arch. mikr. Anat. xiv. p. 167. Cf. also (9), where Greef's results are said to be in the main confirmed.

Acanthocystidæ (12). In development, some show two nuclei; budding also takes place, the bud cleaving into amœboid germs.

Actinophrys sol (12). Observed to send out a number of bi-ciliated amœboid bodies.

Hedriocystis pellucida, H. & L., (1) p. 67, described.

Clathrulina elegans, Cien., (1) p. 68, described. It is thought that it should be placed in the same genus as the preceding.

Lithocolla globosa, F. E. S., (1) p. 75. Perhaps not a *Heliozoon*.

Dictyochoa (24), probably a *Rhizopod*, between *Thalassicolla* and the siliceous sponges.

Polytrema balaniforme (4) = *Carpenteria* (Gray) *balaniformis*; locality should be Polynesian Seas. *Dujardinia* (Gray) is a var. of the same.

Polytrema miniaceum, var. *album* (4), distinguished from *Carpenteria* and young *Planorbulina larvata*.

Tinoporus vesicularis (4) should be *Calcarina vesicularis*.

Ovulites (20). The genus to be referred to the porcellaneous *Forami-*

nifera, and placed near *Dactylopora* and *Acicularia*, as showing areolated shell-structure ; its pores are closed.

Globigerina (20) connects the hyaline forms with *Dactylopora* by its rudimentary canal system.

Squamulina (5) is apparently the arenaceous representative of the *Carpenteria*. [Cf. also under *Haliphysema* (*Spongida*)].

Globigerina echinoides (12), p. 342, pl. xx. fig. 7, = *Hastigerina murrayi*, W. Th. (P. R. Soc. xxiv. 1876, p. 534). Is surrounded by alveoli.

Globigerina bulloides (12), p. 343, pl. xx. fig. 8. Cell wall two-layered.

Rotalina inflata (12), p. 344, pl. xx. figs. 9 & 10. This generally, like all the observed specimens of the two preceding species, has but one nucleus.

Pulvinulina (3 of *Spongida*) and other *Rotalina*s taken in 50 fathoms, Cape Napoleon, Smith's Sound.

Rotia (♀ *Rotalia*) *veneta*, M. Sch., (10) p. 69, pl. i. figs. 4 a & 4 b.

ARCHER (1 A) recapitulates the structure, &c., of many of the following, adding additional observations of his own as given below :—

Mastigamæba aspera, Sch., p. 350, pl. xxi. fig. 24.

Placopus ruber, Sch., p. 349, pl. xxi. fig. 23.

Gymnophrys cometa, Cien., p. 348, pl. xxi. fig. 22. Perhaps a detached portion of a *Gromia*.

Arachnula impatiens, Cien., p. 347, pl. xxi. fig. 21.

Vampyrella spirogyra, Cien., p. 347.

Leptophrys cinerea and *L. elegans*, H. & L., p. 345, pl. xxi. figs. 19 & 20.

Dactylospherium vitreum, H. & L., p. 344, pl. xxi. fig. 17.

Hyalodiscus rubicundus, H. & L., p. 342, pl. xxi. fig. 16.

Pelomyxa lacustris, Gr., p. 337, pl. xxi. figs. 10–15. In England, only near London.

Cochliopodium pellucidum and *C. pilosum*, p. 334, pl. xxi. fig. 8. Form a distinct genus, probably next to *Arcella*.

Trogodytes zoster, Gbr., p. 331, pl. xxi. figs. 1–7. Development given ; it is apparently identical with *Chlamydothrys stercorea*, Cien.

Euglypha tineta, A., p. 330. Ireland and Scotland.

Euglypha alveolata (14). Observed to bud, apparently in the same way as *Chlamydothrys stercorea*, Cien.

Nebela flabellulum and *N. miniata* (14). Apparently conjugate, leaving the test and forming two new individuals.

Euglypha ampullacea, H. & L., (1 A) p. 203, pl. xiii. fig. 7.

Gromia paludosa, Cien., (1 A) p. 201, pl. xiii. fig. 5. Apparently an amphistomatous form, perhaps a *Ditrema*.

Gromia (24). Is not a typical Reticularian, having both nucleus and contractile vacuole.

Platoom parvum, Sch., (1 A) p. 199, pl. xiii. fig. 4. Probably of the same genus as *Chlamydothrys stercorea*, Cien., p. 198, pl. xiii. fig. 3, which is possibly a *Plagiophrys*.

Lecythium hyalinum, H. & L., (1 A) p. 197, pl. xiii. figs. 1 & 2. Probably also a *Plagiophrys*.

Plagiophrys scutiformis, H. & L., (1 A) p. 123, pl. viii. fig. 11.

Plagiophrys sacciformis, H. & L., (1 A) p. 122, pl. viii. fig. 11.

Microgromia socialis, Ar. (1 A), p. 115, pl. viii. fig. 8. Flagellated zoospores are budded from the protoplasm; it still appears to be distinct from *Gromia*.

Pleurophrys lageniformis, E. Sch., (1 A) p. 204, pl. xiii. fig. 9.

P. compressa, E. Sch., (1 A) *ibid.*

Cyphoderia truncata, E. Sch., (1 A) p. 203, pl. xiii. fig. 6.

Diffugia (16). History of the genus given, and a list of 14 "well-marked varieties" given as belonging to the American fauna; these (including two new forms, *vide infra*) are considered as forming but one species, though they are distinct according to Ehrenberg and others.

D. acropodia, H. & L., (1 A) p. 114.

Quadrula symmetrica, E. Sch., (1 A) p. 112, pl. viii. fig. 6. Probably not a *Diffugia* (as Wallich says).

Hyalosphenia lata, E. Sch., (1 A) p. 110, pl. viii. fig. 5; and (20 A) where Tatem states that he figured it in M. Micr. J., 1870, as *Diffugia ligata*.

Pyxidicula operculata, Ehrb., (1 A) p. 110.

Pseudochlamys patella, C. & L., (1 A) p. 107, pl. viii. figs. 1-3. A "condensed," encysted state observed.

Arcella vulgaris, Ehrb., (1 A) p. 79, and (2) p. 4, pls. i. A-D. Development at length (*vide infra*).

Amphizonella flava, Gr., (17) p. 315, pl. ii. figs. 1-5, 8, 11, & 12. Show "gymnomonic" and "leptomonic" developmental stages, which perhaps represent phylogenetic stages. *A. violacea*, Gr., p. 464; nucleus resembles that of *Foraminifera*, outline not sharp.

Chilomonas. Antea, p. 3.

Diselmis dunali, Duj., (21) is developed, according to the author, from *Anisonema sulcata* under the influence of the amount of salt in the water; and itself tends to break into small masses under influence of a strong solution of the same.

Anisonema sulcata (21) passes through stages resembling *Amaba*, *Chlamydococcus*, *Chlorococcus*, and *Heteromitas*.

Amphileptus moniliger, Ehrb., (17). The encystation as stated by Guanzati is really such, perhaps affected by evaporation of the water, &c.

Distigma (17) shows a "leptomonic" stage, and perhaps *Euglena* is one stage of it. Perhaps *D. tenax*, *viride*, and *glaucum* are but colour varieties of *D. proteus*.

Huxley (13) thinks that *Protamæba*, *Protogenes*, and *Myxodictyum*, Hæck., may be mere stages of a cycle of forms filled up by *Myxastrum* and *Vampyrella*.

Pyrocystis (P. R. Soc. xxiv. pl. xxi.) is believed to be a shelled *Noc-tiluca*, not a Diatom (24).

Protamæba primitiva (17 D) described.

Vampyrella (17 D) and *V. pendula*, Cien., and *V. spirogyra* (p. 367), diagnoses given. From Valcuvia, in Italy.

CLASSIFICATION.

HUXLEY (13) divides the *Protozoa* into

I. *Monera* (no nucleus).

II. *Endoplastica* (distinct internal nucleus).

He also distinguishes different forms as either "*Myxopod*" or "*Mastigopod*."

WALLICH (24) repeats his 1865 Classification. He considers "*Radiolaria*" a bad group.

CARTER (3) holds that "*Imperforata*" and "*Perforata*" must be united.

ANATOMY AND DEVELOPMENT.

Arcella (2) may have four nuclei, probably owing to fission. As a further stage in this development, *A. vulgaris* was observed with no nucleus but full of cell-like bodies which developed nuclei, and emerged from the mother-cell. These cells divide either by segmentation of the entire cell, forming a morula, the outer cells being formed around superficial vacuoles (in some cases the nuclei had apparently broken up into granules, which were ejected), or by division of the nucleus alone into five.

Parasitic *Monothalamia* observed in the *Arcella*, p. 20.

Spores from nucleus (2) were observed in the parasite *Phonergates*, g. n.

Plasmodia of colonial Rhizopods:—(2) Observed to result from fusion of amœboid bodies proceeding from resting spores of *Phonergates*; the plasmodium becomes encysted.

Spicules in *Foraminifera*:—(6) Calcareous spicula in the sp. n. described, united by calcareous matter.

Laminar *Foraminifera*:—(5) *Polytrema planum* occurs in sheets.

Bathybius. Cf. *antèa*, p. 3.

Coccosphere (24), p. 342; originally carries the coccoliths; perhaps it is an algal sporangium, perhaps animal; two species given (pl. xvii.).

DISTRIBUTION.

E. P. Wright (25) gives lists of the *Foraminifera* dredged at the Seychelle Islands, and near Cagliari (Sardinia); 52 species or varieties, including 3 new, from the former, 35 from the latter.

Carter (*Spongida*, 3) mentions *Pulvinulina*, *Dictyocha*, &c., as taken by dredging in Smith's Sound, Cape Napoleon.

Entz (8) mentions finding *Amœba limax* and *A. radiosa*, Ehrb., in the sea at Cuxhaven; and in a salt-pan near Klausenburg finds *Ciliophrys*, four species of *Amœba*, and *Podostoma*, and generalizes as to the relations of the fauna under the exceptional conditions mentioned. *A. marina*, Duj., *A. polypodia*, Sch., and ? *Protamœba polypodia*, Hæck., = *A. radiosa*, Ehr.; *id. l. c.* p. 360.

Leidy (14) remarks that Rhizopods are scarce in limestone districts.

He also (16) enumerates 14 American species of *Diffugia*; cf. also his "Rhizopods in an Apple Tree," *l. c.* p. 321.

Gremma (10) mentions as taken with the collections from the Aral and Caspian, *Rotalia? veneta*, besides new species.

Maggi (17 A) gives a synopsis of the recorded localities of the different species of *Monera*.

NEW GENERA AND SPECIES.

RADIOLARIA.

Heliosphæra hæckeli, Gremma (10), p. 68, pl. i. fig. 3.

Schultzia, *id. l. c.* p. 67, pl. i. fig. 2 (*S. pelagica*, sp. n.). A Clathrulinid, with pseudopodia originating in the nucleus.

Protostrum, *id. l. c.* p. 64, pl. i. figs. 1, *a*, *b*, *c*, *i*, *k* (*P. marina*). An Acanthocystid with very distinct superficial substance. Development, showing amoeba-, æthalion-, and encysted stages, observed.

Sticholonche, Hertwig (12), p. 324, pl. xx. *S. zanclea*. Central capsule; radiating processes, penetrated by pseudopodia; surface set with clumps of hollow spicules.

Orbulinella, Entz (8), p. 195, pl. x. figs. 9-12 *O. smaragdea*. Near *Clathrulina*, but laterally flattened (? *Foraminifer*, Entz). In salt pan.

FORAMINIFERA.

Textilaria (? *Textularia*) *caspia*, Gremma (10), p. 70, pl. i. fig. 5.

Phonergates, Buck (2), p. 20, pl. i. figs. 1-6. *P. vorax*, sp. n. Parasitic; roundish cuticular shell, with neck; Monothalamian; pseudopodia thread-like; two posterior contractile vacuoles, one nucleus. In water-plants and minute animals. The young resemble the parent; a resting stage produces spores.

Ditrema flavum, Archer (1 A), p. 336, pl. xxi. fig. 9.

Plagiophrys hertwigiana, *id. l. c.* p. 123 (figured, without name, in Q. J. Mic. Sci. xi. p. 146).

Microgromia mucicola, *id. l. c.* p. 121, pl. viii. fig. 9, on minute *Algæ*, Cönnemara.

Campascus, Leidy (14), p. 293. *C. cornutus*. Differs from *Cyphoderia* in its lateral processes; Wyoming, 10,000 feet.

Rotalia spiculotesta, Carter (6), p. 470, pl. xvi., East Oceania.

Gypsinu, Carter (5), p. 172 (*G. melobesioides*, = *Polytrema planum*, C.), based on *Tinoporus vesicularis*.

Ovulites margaritula, Parker and Jones (20), p. 77.

Rupertia, Wallich (24). Rotaline in form; between *Pulvinulina* and *Globigerina* in structure (shell vitreous, coarse canals, foreign bodies on some parts. *R. stabilis*.

Carpenteria monticularis, Carter (4), pl. xiii. figs. 9-15; described, Australia ?, &c.

Bidelloidina, Carter (3), p. 201, pl. xiii. figs. 1-8. *B. aggregata*. Arenaceous, flatly sessile, broad chambers, the last one terminally perforated; canal system; pores in roof.

Microcometes tristrypetus, Entz (8), p. 194, pl. x. figs. 1-5; salt-pan.

Plectophrys, *id. l. c.* p. 192, pl. ix. figs. 5-7. *P. prolifera*. Differs from

Pleurophrys in having the shell composed of a coarse calcareous network ; salt-pan.

Pleurophrys helix, Entz (8), p. 186, pl. ix. figs. 1-4 ; salt-pan.

Quadrula irregularis, Archer (1 A), p. 113 ; various localities.

NOCTILUCINA.

Leptodiscus, Hertwig (12), p. 307, pls. xvii. & xviii. *L. medusoides*.

Differs from *Noctiluca* in its normally placentoid form ; also in double character of nucleus, and unstriped flagellum ; Messina.

FOSSIL RHIZOPODA.

NEW GENERA.

Ascodictyon,* Nicholson & Etheridge (19), p. 463, pl. xix. *A. fusi-forme*, *stellatum*, and *radians*, spp. nn. Composed of calcareous cells, with minute foramina ; no large aperture ; cells united by tubes of varying dimensions.

Schwagerina, Möller (18), p. 143. Like *Fusulina*, except in the non-plicated character of the outer part of septum (based on *Borelis sphaeroidea*, Borel).

Hemifusulina, id. l. c. p. 144. Like *Fusulina*, but septum is two-layered, producing grooves on surface. (1 sp.) Twer, near Prjamuchina ; Carboniferous limestone.

Fusinella, id. *ibid.* fig. p. 145. Differs from *Fusulina* in the slightness of the plication and the thickness of septa, which carry canals and a "supplemental skeleton." (1 sp.) Near Twer ; Carboniferous limestone.

REMARKS ON FOSSIL FORMS, DISTRIBUTION, &c.

Parkeria rejected by Carter (7) from the *Foraminifera*, owing to its large foreign nucleus, and compared with *Hydractinia*. He distinguishes 3 species.

Loftusia persica, Br., considered (7) as also akin to *Hydractinia*, rather than to the *Foraminifera*. Zittel (*Spongida*, 18) supports these opinions.

Stromatopora (7) also agrees strikingly with *Hydractinia* in its minute fibre-characters, &c.

A list of genera and species, with the formations, &c., of America, is given in "The American Palæozoic Fossils," by S. A. Miller (Cincinnati, Ohio : 1877).

A supplementary note on the *Foraminifera* of the chalk of the New Britain group, by H. B. Brady, Geol. Mag. iv. p. 534, gives a list of species, including a *Globigerina*, sp. n., and *Pulvinulina*, sp. n.

Webbina, D'Orb. Sollas (22) proposes to restrict this name to the perforate forms (which he, for the first time, shows to exist) leaving the rest to *Trochammina*. He describes 2 new species.

* The authors are uncertain whether it is Foraminiferous, Sertularian, or Polyzoan in affinities.—S. O. R.

INFUSORIA.

PAPERS, &c.

[In addition to some cited under *Rhizopoda*, but relating to *Infusoria* as well.]

25. BÜTSCHLI, O. Ueber *Dendrocometes paradoxus*, nebst einigen Bemerkungen über *Spirochona gemmipara*, &c. Z. wiss. Zool. xxviii. p. 49, pl. vi.
26. FROMENTEL, E. DE. Études sur les Microzoaires ou Infusoires proprement dits. Journ. Micrographie, i. p. 75. [Not seen by the Recorder.]
27. HERTWIG, R. Ueber den Bau und die Entwicklung der *Spirochona gemmipara*. Jen. Z. Nat. xi. p. 149, pls. x.-xii.
28. LEIDY, J. On intestinal parasites of *Termes flavipes*. P. Ac. Philad. 1877, p. 146.
29. —. Remarks on some Parasitic *Infusoria*. Tom. cit. p. 259.
30. VAN REES, —. Bijdrage tot de Biologie der Infusorien. (Prize dissertation of the Athenæum of Amsterdam, with plate.) Reported in Nederl. Arch. Zool. iv.
31. WRZESNIEWSKI, A. W. "Ueber Infusorien;" and "Beiträge zur Naturgeschichte der Infusorien." Z. wiss. Zool. xxix. p. 267, pls. xix.-xxi. (the first is an abstract of the latter, as reported from the Protocols Assembl. Russ. Naturalists & Physicians, Sept., 1876, in Z. wiss. Zool. xxviii. p. 404).
32. ZELLER, E. Untersuchungen über die Fortpflanzung und die Entwicklung der in unseren Batrachiern schmarotzenden Opalinen. Z. wiss. Zool. xxix. p. 353, pls. xxiii. & xxiv.

Cf. also notes on the Littoral and Deep Fauna of the Lake Lemman (Geneva), by F. A. FOREL, in Bull. Soc. Vaud. xiv. p. 202; also a report on J. FRAIPONT'S "Recherches sur les Acinétariens," &c., in Bull. Ac. Belg. (2) xlv. p. 692 (it refers to *Ophryodendrum belgicum*, *Acineta divisa*, &c.).

GENERA, SPECIES, &c., REFERRED TO.

Spirochona gemmipara, St. (25) The apparent budding is real, for the old nucleus divides for the bud. (27) Relations of the spiral funnel further elucidated; cilia feeble; nucleus passes through many changes; before the gemmation is divided into a granular and a homogeneous part:—three oval paranuclei; in development, the nucleus shows much internal disturbance, and takes the form of several rods laid side by side, which end in threads; paranuclei also lengthen, and give off three portions to the embryo, which is constricted off as a cleft cup; no *Acineta* stage.

Ophrydium versatile, E., (31) p. 298, pl. xx. figs. 6-11, pl. xxi. figs. 1-20. A green and a colourless variety distinguished; the "transverse ribs" are merely swellings of outer parenchyma; individuals have separate capsules; colonies formed by meeting of individuals.

Epistylis plicatilis, E., (30). Nucleus reformed, after reproduction, by portions of old nuclei; some large globules found among the small segmentation spheres.

E. flavicans, E., (31) p. 281, pl. xx. figs. 1-4. Differs from Greef's description; no digestive cavity made out. *E. grandis* is a later stage of it.

Zoothamnium arbuscula, (31) p. 292, pl. xix. fig. 20. Stalk-muscle of fine fibrils; its two branches act differently from each other under polarized light.

Oxytricha fallax and *Stylonychia pustulata* (30). The dark spheres formed after copulation are probably endoplasmic formations. The former is subject to parasites in the nucleus (vide *infra*, under Anatomy, &c.)

Anoplophrya lumbrici (29). Found in *Enchytræus socialis*.

A. (formerly *Leucophrys*) *clavata* and *cochleariformis* (29) in two species of *Lumbriculus*.

A. intestinalis, St., (32) p. 370, pl. xxiv. figs. 40-45. Referred to *Opalina*, and called *O. similis* [1].

Nyctotherus cordiformis, (32) p. 375. Development much as in *Opalina*.

Balantidium, (32) p. 375. No cysts.

Opalina ranarum, Prk. & Val., (32) p. 353, pl. xxiii. Development by fission, encystation, emergence (often with several nuclei, which give place to one), subdivision of nucleus to form the large ultimate number; fission is sometimes arrested, and renewed growth takes place.

O. obtrigona, St., (32) p. 365, pl. xxiv. figs. 27-31. Development in exactly the same stages as preceding.

O. dimidiata, St., (32) p. 367, pl. xxiv. figs. 32-37. Development essentially the same; it is accompanied by a broader and thicker form (p. 368, pl. xxix. figs. 38 & 39), perhaps a new species.

Dendrocometes paradoxus, (25) p. 49, pl. vi. The basal surface has a thin plate, perhaps equivalent to the pedicel of other Acinetines; the arms are body-processes, containing body-granules and fibrils, the tips apparently perforated by canals; there is an efferent tube to the contractile vacuole; the bud is formed from the plasma, afterwards lies in a cavity with a duct, and remains connected with mother for a time by a thread. Cf. also (31) p. 270, pl. xix. figs. 8-6. Tubular ending of arm-fingers, used to enclose *Infusoria*.

Acineta hyphydri, St., (31) p. 268, pl. xix. figs. 7-9. Excretory tube to contractile vacuole.

A. mystacina (25). Apparently contains a "vestibulum" beneath the cuticle, which receives contents of contractile vacuole by small openings.

Urnulla epistylidis, Cl. & L., (31) p. 267, pl. xix. fig. 1. Referred to the *Acinetidae* by its tentacle-characters.

GENERAL ANATOMY, &c.

The contractile vacuole is connected (25) with a "vestibule" and a "reservoir," which lie between it and the exterior in some *Vorticella*. [Cf. *Acineta mystacina*, *suprà*.]

Paranuclei: an asexual fission of them occurs in *Spirochona* (27).

Difference in nature of nuclei in *Opalina* from those of other *Infusoria* (32); they being bags of liquid in this case, and more resembling cell-nuclei.

Parasitism observed within *Vorticella microstoma* and *V. campanula*, and in nucleus of *Orytricha fallax* (30). In this case, the parasites were probably some of the lower *Thallophytes*. They have no contractile vacuole; they break up the nucleus while passing from the monad- to the cell-form, and cleaving; nucleus may be extruded; the parasites show vibratory motions when free.

DISTRIBUTION.

Forel (*antèd*, p. 9) mentions *Ophrydium versatile*, *Carchesium polypinum*, *Zoothamnium arbuscula*, and *Stentor ceruleus*, from shallow parts of the Lake of Geneva, and *Vorticella convallaria*, from a greater depth.

Gremma (10) mentions *Acineta tuberosa*, E., *Colpoda pigerrima*, Cohn, *Nassula flava*, Cl., *Euplotes charon*, E., *Stylonychia* sp., *Carchesium* sp., as taken during his Aralo-Caspian researches.

Carter (in "Arctic and Antarctic Sponges," *vide Spongida*) mentions *Lagotia viridis* and *Freia ampulla* from Smith's Sound, Cape Napoleon, 50 fathoms.

NEW GENERA AND SPECIES.

Peritricha.

Tintinnus mitra, Gremma (10), p. 76, pl. ii. fig. 9.

Epistylis steini, Wrzesniowski (31), Warsaw and Rugen.

Zoothamnium cienkowskii, id. l. c. p. 278, pl. xix. figs. 16 & 17, E. coast of Rugen.

Hypotricha.

Hclosticha, id. l. c. p. 278. Based on the species of *Oxytricha* which show continuous infra-ciliation.

Oxytricha pernix, id. l. c. p. 273, pl. xix. figs. 10 & 11.

Oxytricha kessleri, id. l. c. p. 275, pl. xix. figs. 12-15.

Heterotricha.

Climacostomum longissimum, Gremma (10), p. 74, pl. ii. fig. 7.

Trichonympha, Leidy (28), p. 147. *T. nympha*. Anterior part of body clothed with cilia of more than length of body; no mouth observed. Habitat, intestine of *Termes flavipes*.

Pyrsonympha, id. l. c. p. 148. *P. vertens*. Perhaps a larval form of preceding; no evident cilia or mouth. Habitat, as preceding.

1877. [VOL. XIV.]

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Dinenympha, id. *l. c.* p. 148. *D. gracilis*. Ciliated; apparently intermediate between the two preceding forms. Habitat, as preceding.

[NOTE.—The descriptions of these three genera are not very distinct, and the Sub-order to which they belong is not clear.]

Holotricha.

Lacrymaria caspia, Gremma (10), p. 71, pl. ii. fig. 8 a-d. Metamorphosis given.

Opalina caudata, Zeller (32), p. 373, pl. xxiv. figs. 46-51. The development agrees with that of the other Opalines there described. Habitat, rectum of *Bombinator igneus*.

Anoplophrya vermicularis, Leidy (29). Large. Habitat, rectum of *Paludina decisa*.

GREGARINÆ.

LEIDY, P. Ac. Philad. 1877, p. 196, in "Remarks on Gregarines," describes *Monocystis agilis*.

GENERALITIES, CELL-THEORY, PHYLOGENY, &c.

In addition to the works already mentioned may be specially noticed :

BROOKS, W. K. On a Provisional Hypothesis of Pangenesis. Abstract in P. Am. Ass. xxv. p. 177.

DALLINGER, W. H., & DRYSDALE, J. The Development of the Ovum. M. Micr. Journ. xviii. p. 86; Nature, xvi. p. 178.

An analysis and criticism of Bütschli's Stud. über d. erst. Entw. d. Eizelle, &c.

ELSBERG, LOUIS. On the Plastidule Hypothesis. P. Am. Ass. xxv. p. 178.

GHIRINGHELLO, —. Continuazione della Memoria sulla teoria di Darwin. Atti Acc. Tor. xii. pp. 748, 758, & 760.

HUXLEY, T. Anatomy of Invertebrata. (London : 1877. Cited above).

Contains some important statements as to Phylogeny, Abiogenesis, &c., in the Introduction.

LANKESTER, E. RAY. Notes on Embryology and Classification. (London : 1877); Q. J. Micr. Sci. xvii. p. 399.

Contains a further exposition of the author's "Planula-theory," and a classification of the animal kingdom based on the facts of development.

MCCRADY, JOHN. A Provisional Theory of Generation. P. Bost. Soc. xix. p. 171.

This combines the facts of general embryology with those of the reproduction of *Protozoa*, and compares the two.

MINOT, C. SEDGWICK. On the formation of the Germinal Layers and

the phenomena of Impregnation among Animals. P. Bost. Soc. xix. p. 165.

Concludes that total yolk-segmentation is universal, as also a real alternation of generations.

STRASBURGER, E. Ueber Befruchtung und Zell-theilung. Jen. Z. Nat. xi. p. 435, pls. xxvii.-xxxv.

A largely illustrated treatise, seeking to explain the general phenomena of fertilization by circumstances occurring in animal and vegetable cells.

The development of the forms of animal life is discussed at some length, with especial reference to modern discoveries and theories, in the inaugural address of Prof. Allen Thomson, Brit. Ass. 1877, reported in Nature, xvi. pp. 302-311.

INDEX TO

GENERA AND SUBGENERA RECORDED AS NEW IN THIS VOLUME.

INCLUDING NAMES PROPOSED FOR GENERA ALREADY
CHARACTERIZED.

The symbol || indicates that the name to which it is affixed has been used before in Zoology.]

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| <p>Ablepton, <i>Frivaldszky</i>, Ins. 31.
 Acallopais, <i>Pascoe</i>, Ins. 73.
 Acalodegma, <i>J. Thomson</i>, Ins. 78.
 Acantharacna, <i>Smith</i>, Ech. 8.
 Acanthoctenus, <i>Keyserling</i>, Arachn. 13.
 Acanthoglossus, <i>Gervais</i>, Mamm. 24 [ssa, <i>Kraatz</i>, Coleoptera, 1859].
 Acanthogryllus, <i>Saussure</i>, Ins. 214.
 Acanthoplistus, <i>Saussure</i>, Ins. 216.
 Acanthus, <i>Lockington</i>, Crust. 14.
 Acarodes, <i>Wollaston</i>, Ins. 76.
 Aceste, <i>W. Thomson</i>, Ech. 6.
 Acorypha, <i>Krauss</i>, Ins. 219.
 Acrobes, <i>Linstow</i>, Verm. 12.
 Acroptychia, <i>Crosse & Fischer</i>, Moll. 77.
 Actæomorpha, <i>Miers</i>, Crust. 18.
 Adicella, <i>McLachlan</i>, Ins. 200.
 Adorea, <i>Lefèvre</i>, Ins. 85.
 Ægipan, <i>Scudder</i>, Ins. 217.
 Æthalochroa, <i>Wood-Mason</i>, Ins. 210.
 Aethodoris, <i>Abraham</i>, Moll. 53.
 Aganippe, <i>Cambridge</i>, Arachn. 7.
 Aglophus, <i>Sharp</i>, Ins. 50.
 Agorius, <i>Thorell</i>, Arachn. 16.
 Ala, <i>Lockington</i>, Crust. 11.
 Albinia , <i>Brosi</i>, Ins. 179 [Desvoidy, Diptera, 1830].
 Allerya, <i>Mörch</i>, Moll. 36.
 Allomerus, <i>Mayr</i>, Ins. 103.
 Allomys, <i>Marsh</i>, Mamm. 22.
 Allotræus, <i>H. W. Bates</i>, Ins. 80 [-trius, <i>Laporte</i>, Coleoptera, 1840].
 Amalusia, <i>Mulsant</i>, Aves 34.</p> | <p>Ambivia, <i>Stål</i>, Ins. 210.
 Ammocrypta, <i>Jordan</i>, Pisc. 9.
 Ammosphacidium, <i>Kohl</i>, Ins. 100.
 Amorphochilus, <i>Peters</i>, Mamm. 11.
 Amphiplatys, <i>Sharp</i>, Ins. 49.
 Amydropa, <i>Reitter</i>, Ins. 37.
 Amynodon, <i>Marsh</i>, Mamm. 17.
 Anacyptus, <i>Horn</i>, Ins. 25 [-ta, <i>Illiger</i>, Coleoptera, 1807].
 Analophus, <i>Waterhouse</i>, Ins. 78.
 Anastæchus, <i>Osten-Sacken</i>, Ins. 192.
 Anaxarcha, <i>Stål</i>, Ins. 210.
 Ancylocura, <i>Cameron</i>, Ins. 115.
 Anisopaulax, <i>Reitter</i>, Ins. 36.
 Annia, <i>Stål</i>, Ins. 209.
 Anomacora, <i>Studer</i>, Cœl. 6.
 Anomisma, <i>McLachlan</i>, Ins. 206.
 Anotheorus, <i>Blackburn</i>, Ins. 75.
 Antapлага, <i>Grote</i>, Ins. 168.
 Antenna, <i>Stål</i>, Ins. 210.
 Antenella, <i>Allman</i>, Cœl. 18.
 Antennophorus, <i>Haller</i>, Arachn. 21.
 Antennopsis, <i>Allman</i>, Cœl. 17.
 Antezumia, <i>Saussure</i>, Ins. 98.
 Anthicodes, <i>Wollaston</i>, Ins. 66.
 Antissa, <i>Stål</i>, Ins. 210.
 Aurogryllus, <i>Saussure</i>, Ins. 214.
 Aphanoroptra, <i>C. G. Thomson</i>, Ins. 110.
 Aphidileo*, <i>Rondani</i>, Ins. 111.
 Apocalypsis, <i>Butler</i>, Ins. 144.
 Aporophis, <i>Cope</i>, Rept. 5.
 Apræa, <i>Baly</i>, Ins. 89.
 Aptenopedes, <i>Scudder</i>, Ins. 219.
 Apterogryllus, <i>Saussure</i>, Ins. 213</p> |
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* The genera thus marked, mostly referred to *Rondani*, are possibly not new, but do not seem to have been previously recorded.

- Apteromimus, *Wollaston*, Ins. 21.
 Archæobdella, *Gronma*, Verm. 18.
 Ardesca, *Stål*, Ins. 210.
 Arimimelus, *Kraatz*, Ins. 31.
 Ariusia, *Stål*, Ins. 209.
 Armene, *Stål*, Ins. 210.
 Arria, *Stål*, Ins. 209.
 Artoria, *Thorell*, Arachn. 15.
 Arulenus, *Stål*, Ins. 219.
 Asbecesta, *Harold*, Ins. 92.
 Ascodictyon, *Nicholson & Etheridge*, Prot. 8.
 Aspasola, *Chaudoir*, Ins. 17.
 Aspectrogaster, *J. Thomson*, Ins. 78.
 Aspella, *Mörch*, Moll. 35.
 Astape, *Stål*, Ins. 210.
 Asternotremia, *Jordan*, Pisc. 18.
 Atania, *C. G. Thomson*, Ins. 230 [-ius, *Harold*, Coleoptera, 1867].
 Athamas, *Cambridge*, Arachn. 16.
 Atholurus, *Sharp*, Ins. 44.
 Atrax, *Cambridge*, Arachn. 7.
 Atritonus, *Reitter*, Ins. 40.
 Augusta, *Cambridge*, Arachn. 11.
 Auxoxysta, *C. G. Thomson*, Ins. 114.
 Avella, *Cambridge*, Arachn. 15.
 Axylus, *Stål*, Ins. 217.
 Bactronophorus, *Tapparone-Cane-fri*, Moll. 79.
 Badizoblax, *J. Thomson*, Ins. 46.
 Balcus, *Sharp*, Ins. 55.
 Bantia, *Stål*, Ins. 210.
 Baptornis, *Marsh*, Aves 59.
 Bathyrthrisa, *Günther*, Pisc. 25.
 Batrachichthys ||, *Pizarro*, Rept. 11 [*Agassiz*, 1848, amending *Batric-tius*, *Rafinesque*, Pisces, 1815].
 Bavia, *Simon*, Arachn. 17.
 Bdelloidina, *Carter*, Prot. 7.
 Beleses, *Cameron*, Ins. 115.
 Bellidia, *Gosse*, Crust. 21.
 Bessaphilus, *Waterhouse*, Ins. 37.
 Bigea, *Nardo*, Crust. 20.
 Blanaida, *Kirby*, Ins. 133.
 Blastomeryx, *Cope*, Mamm. 19.
 Blepharocera ||, *Chambers*, Ins. 184 [*Agassiz*, 1848, amending *Blepha-ricera*, *Macquart*, Diptera, 1843].
 Blephylidia, *J. Thomson*, Ins. 78.
 Boholia, *Kossmann*, Crust. 32.
 Bolbe, *Stål*, Ins. 210.
 Bolboneura, *Godman & Salvin*, Ins. 131.
 Bolivaria, *Stål*, Ins. 210.
 Botanoctona, *Fairmaire*, Ins. 92.
 Bothriomicromus, *Scudder*, Ins. 202.
 Brachycrotaphus, *Krauss*, Ins. 219.
 Brachymeryx, *Cope*, Mamm. 18.
 Bradynemesis, *Waterhouse*, Ins. 80.
 Bramocharax, *Gill*, Pisc. 24.
 Brugmoia [-mœa], *Radoszkowsky*, Ins. 104.
 Butio, *Reichenow*, Aves 56 [-teo, *Cuvier*, Aves, 1800].
 Cacopsodos, *Butler*, Ins. 175.
 Cænoplana, *Moseley*, Verm. 8.
 Cæparia, *Stål*, Ins. 208.
 Calamidia, *Butler*, Ins. 153.
 Callatolmis, *Butler*, Ins. 153.
 Callibia, *Stål*, Ins. 210.
 Callimantis, *Stål*, Ins. 210.
 Callispongia, see *Kallispongia*.
 Callistroma, *Fairmaire*, Ins. 48.
 Callodictyon [Callid-], *Sollas*, Spong. 9.
 Callodictyon [Callid-], *Zittel*, Spong. 10.
 Calochæstis [Callich-], *Bigot*, Ins. 191.
 Caloctenus [Callict-], *Keyserling*, Arachn. 13.
 Calymno, *W. Thomson*, Ech. 6 [-nia, *Hübner*, Lepidoptera, 1816].
 Calyptites, *Scudder*, Ins. 4.
 Campascus, *Leidy*, Prot. 7.
 Camptocera, *Jakovleff*, Ins. 224 [-rus, *Dejean*, Coleoptera, 1821].
 Camptopleura, *Mabille*, Ins. 139.
 Campylona, *Möschler*, Ins. 153.
 Caritheca, *Baly*, Ins. 92.
 Carlottæmyia, *Bigot*, Ins. 196.
 Carteriospongia, *Hyatt*, Spong. 6.
 Catophis, see *Katophis*.
 Cauphias, *Brocchi*, Rept. 13.
 Cerinius, *Thorell*, Arachn. 12.
 Cestopoda, *Kurz*, Crust. 35.
 Cete[or]rhinops, *Leidy*, Mamm. 15.
 Chærilus [Chœ-], *Simon*, Arachn. 18.
 Chalcotrogus, *Wollaston*, Ins. 75.
 Chalia, *Moore*, Ins. 158.
 Chariderma, *Baly*, Ins. 83.
 Charmosynopsis, *Salvadori*, Aves 29.
 Cheilolabrus [Chi-], *Alleyne & Macleay*, Pisc. 20.
 Cheiropteruges [Chiropteryges], *Ramsay*, Mamm. 10.
 Chiereghinia, *Nardo*, Crust. 21.
 Chilodiplus, *Sharp*, Ins. 44.
 Chimarroga, *Anderson*, Mamm. 11.
 Chlanidophora, *Berg*, Ins. 151.
 Chlorodopsis, *Milne-Edwards*, Crust. 13.
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- Choris, *Lefèvre*, Ins. 85.
 Chrysæglia, *Butler*, Ins. 153.
 Chrysor[rh]abdia, *Butler*, Ins. 153.
 Cinetoscias, see Kinetoscias.
 Cirsonella, *Angus*, Moll. 46.
 Cladonotus, *Thorell*, Arachn. 12.
 Clavigerodes, *Raffray*, Ins. 30.
 Cleostratus, *Stål*, Ins. 219.
 Clepsine ||, *Gromma*, Verm. 9
 [*Savigny*, Vermes, 1817].
 Cletocamptus, *Schmankewitsch*,
 Crust. 32.
 Cliarthrus, *Raffray*, Ins. 30.
 Clistocoloma, *Milne-Edwards*,
 Crust. 16.
 Clitea ||, *Baly*, Ins. 89 [*Reeve*,
 Crustacea, 1841].
 Colacina, *Westwood*, Ins. 67.
 Colletria, *Nolcken & Zeller*, Ins. 149.
 Colopha, *Monell*, Ins. 233 [-phon,
Westwood, Coleoptera, 1832].
 Comastes, *Osten-Sacken*, Ins. 193.
 Conopsis, *Chevolat*, Ins. 73.
 Constricta, *Böttger*, Moll. 68.
 Copæodes, *Speyer*, Ins. 139.
 Copelandia, *Jordan*, Pisc. 10.
 Cophogryllus, *Saussure*, Ins. 214.
 Corallimorphus, *Moseley*, Cœl. 3.
 Coronacanthus, *Macleay*, Ins. 20.
 Coscinotilix, *Allard*, Ins. 62.
 Cotes, *Sharp*, Ins. 66.
 Craticularia, *Zittel*, Spong. 9.
 Crepidodoris, *Pagenstecher*, Moll. 52.
 Crinopteryx, *Peyerimhoff*, Ins. 184.
 Crossoconotus, *Milne-Edwards*,
 Crust. 18.
 Crypsis, *Waterhouse*, Ins. 62.
 Cryptazeca, *Folin & Berillon*,
 Moll. 67.
 Cryptodendrum, *Klunzinger*, Cœl. 4.
 Cryptommata, *Wollaston*, Ins. 75.
 Cryptoporus, *Uhler*, Ins. 223.
 Ctenodecticus, *Bolívar*, Ins. 217.
 Cutilia, *Stål*, Ins. 208.
 Cycais, *Thorell*, Arachn. 8.
 Cyclopidius, *Copé*, Mamm. 18.
 Cylindroporella, *Hincks*, Moll. 95.
 Cyllodesus, *Reitter*, Ins. 33 [Cyl-
 lodes, *Erichson*, Coleoptera, 1843].
 Cyma[to]derma, *Duns*, Verm. 18.
 Cynarina, *Brüggemann*, Cœl. 6.
 Cyphocoleus, *Chaudoir*, Ins. 18.
 Cyphodera, *Baly*, Ins. 83 [-rus,
Erichson, Neuroptera, 1845].
 Cyttaromyia, *Scudder*, Ins. 4.
 Daturina, *Thorell*, Arachn. 11.
 Decimia, *Stål*, Ins. 210.
 Deiphobe, *Stål*, Ins. 210.
 Demophanus, *Nardo*, Arachn. 20.
 Dendrobiastes, *Sharpe*, Aves 37.
 Diagoras, *Stål*, Ins. 212.
 Diapontia, *Keyserling*, Arachn. 14.
 Didosaurus, *Günther*, Rept. 3.
 Didymocorypha, *Wood-Mason*,
 Ins. 210.
 Digenethle, *J. Thomson*, Ins. 46.
 Dinenympha, *Leidy*, Prot. 12.
 Diotarus, *Stål*, Ins. 219.
 Dipalta, *Osten-Sacken*, Ins. 192.
 Diplodictyon, *Zittel*, Spong. 10.
 Diplogrammus, *Chevolat*, Ins. 74.
 Disceus, *Garnan*, Pisc. 9.
 Discodoris, *Bergh*, Moll. 51.
 D. seomedusa, *Claus*, Cœl. 12.
 Disjunctaria, *Böttger*, Moll. 70.
 Distigmatus, *Domadieu*, Arachn. 22.
 Dittopora, *Dybowsky*, Cœl. 8.
 Dolichomitrus, *Smith*, Ins. 110.
 Dolichoplana, *Moseley*, Verm. 8.
 Dondera, *Moore*, Ins. 156.
 Doryæa, *Stål*, Ins. 208.
 Doryphorus ||, *Reichenow*, Aves 56
 [*Cuvier*, Reptilia, 1829; -ra,
Illiger, Coleoptera, 1807, *Kützinger*,
 Protozoa, 1844].
 Dromæocercus, *Sharpe*, Aves 44.
 Drotus, *Sharp*, Ins. 80.
 Dryococcyx, *Sharpe*, Aves 33.
 Dybowskia, *Dall*, Moll. 41.
 Dysaules, *Stål*, Ins. 210.
 Dyspeithes[-pithes], *Kirsch*, Ins. 73.
 Eboroziphius [? Eborixiphius, vox
 hybr.], *Leidy*, Mamm. 15.
 Edrotopus, *Haag*, Ins. 60.
 Eiratus, *Pascoe*, Ins. 72.
 Elæna, *Stål*, Ins. 210.
 Elamenopsis, *Milne-Edwards*, Crust.
 17.
 Elassoma [? Elassonosoma], *Jordan*,
 Pisc. 18.
 Elpidia, *Théel*, Ech. 4.
 Emarginaria, *Böttger*, Moll. 69.
 Embrocercus, *Peyron*, Ins. 53.
 Enamillus, *Sharp*, Ins. 44.
 Enantius, *Schaufuss*, Ins. 29 [-tia,
Hübner, Lepidoptera, 1816].
 Endosomatium, *Wollaston*, Ins. 21.
 Enneaphyllus, *Waterhouse*, Ins. 78.
 Entella, *Stål*, Ins. 210.
 Epatolmis, *Butler*, Ins. 153.
 Epibates, *Osten-Sacken*, Ins. 193.
 Epichorius, *Kirsch*, Ins. 51.
 Epidius, *Thorell*, Arachn. 12.
 Epilobaspis, *Chevolat*, Ins. 74.

- Epinectes, Régimbart*, [correcting -tus, *Esch.*], Ins. 22.
Epiponus [amending *Epipona*], *Saussure*, Ins. 98.
Episcepsis, Butler, Ins. 151.
Episema||, *Jordan*, Pisc. 28 [*Hübner*, *Lepidoptera*, 1816].
Epismellus, Kirsch, Ins. 70.
Epistranus, Sharp, Ins. 35.
Epitimetes, Pascoe, Ins. 71.
Erebophis, Günther, Rept. 10.
Erginus, Jeffreys, Moll. 47.
Erimodes, Reitter, Ins. 34.
Ericsoma, Jordan, Pisc. 9.
Eriotica, Harold, Ins. 89.
Eryotesis, McLachlan, Ins. 200.
Erymus, Pascoe, Ins. 71 [-nus, *Wagler*, *Reptilia*, 1830].
Eualopia [Eva-], *Böttger*, Moll. 68.
Eubulides, Stal, Ins. 212.
Eucalia, Jordan, Pisc. 11.
Euceromys [-ceratomyia], *Bigot*, Ins. 191.
Eucotoderus, Wollaston, Ins. 75.
Eudoliche, Möschler, Ins. 153.
Eulida, Mulsant, Aves 34.
Eulimacodes, Möschler, Ins. 160.
Eulophopteryx, Möschler, Ins. 159.
Eunicicola, Kurz, Crust. 33.
Eupeodes, Osten-Sacken, Ins. 195.
Euphyma, Buly, Ins. 84.
Eupilumnus, Kossmann, Crust. 14.
Eupomotis, Jordan, Pisc. 10.
Euryceræa, Steinheil, Ins. 88.
Eurypterus||, *Mabille*, Ins. 139 [*De Kay*, *Crustacea*, 1826].
Eury[r]rhynchus, *Miers*, Crust. 21.
Eusmerinthus, Grote, Ins. 144.
Eutheca, Kiesenwetter, Ins. 57.
Euthynous, Stal, Ins. 219.
Euxina, Böttger, Moll. 69.
Euxoga, Möschler, Ins. 159.
Evalopis, see *Eualopia*.
Evenus||, *Simon*, *Arachn.* 16 [*Hübner*, *Lepidoptera*, 1816].
Exentera, Grote, Ins. 181 [-rus, *Hartig*, *Hymenoptera*, 1837].
Filiger, Schaufuss, Ins. 29.
Fisheria, Lockington, Crust. 11.
Fiskia, Grote, Ins. 168.
*Flabrinus**, *Rondani*, Ins. 111.
Fonscolombia, Lichtenstein, Ins. 234.
Freyana, Haller, *Arachn.* 24.
Fruva, Grote, Ins. 168.
Fulciuia, Stal, Ins. 210.
Fulvetta, David & Oustalet, Aves 37.
Fusinella, Möller, Prot. 8.
Galinthias, Stal, Ins. 210.
Gelastocera, Butler, Ins. 159.
Geranus, Sharp, Ins. 50 [-nia, *Serville*, *Coleoptera*, 1835].
Gersemia, Marenzeller, Cœl. 8.
Glacies, Millière, Ins. 175.
Glossonotus, Butler, Ins. 229.
Glyptoxysta, C. G. Thomson, Ins. 114.
Gnathospiza, Taczanowski, Aves 47.
Gonaxis, Taylor, Moll. 57.
Gonenyo, Butler, Ins. 144.
Gonoclostera, Butler, Ins. 159.
Graptcephalus, Elliot, Aves 56.
Grynocharina, Reitter, Ins. 35.
Grynoma, Sharp, Ins. 35.
Gymnocesio, Bleeker, Pisc. 11.
Gymnogryllus, Saussure, Ins. 213.
Gypsina, Carter, Prot. 7.
Hadrodes, Wollaston, Ins. 60.
Halmæusa, Kiesenwetter, Ins. 24.
Halopteris, Altman, Cœl. 17.
Hancockia, Gosse, Moll. 53.
Hapalips, Reitter, Ins. 34.
Hapalopeza, Stal, Ins. 210.
Haplition, Young, Spong. 9.
Haplusia, Karsch, Ins. 188.
Hatamus, Sharp, Ins. 45.
Helioperca, Jordan, Pisc. 10.
Helvia, Stal, Ins. 210.
Hemifusulina, Möller, Prot. 8.
Hemigryllus, Saussure, Ins. 213.
Henotiderus, Reitter, Ins. 38.
Heptadecacanthus, Alleyn & Macleay, Pisc. 19.
*Heptocondyla**, *Rondani*, Ins. 111.
*Heptomerus**, *Rondani*, Ins. 111.
Hereunia, Thorell, *Arachn.* 10.
Hermesia, Lefèvre, Ins. 85.
Heteractæa, Lockington, Crust. 14.
Heteranthus, Klunzinger, Cœl. 4.
Heterocorax, Sharpe, Aves 50.
Heterodipnis, Peyron, Ins. 54.
Hexacoptus, Wollaston, Ins. 75.
Hieroglyphus, Krauss, Ins. 219.
Higginsia, Higgin, Spong. 6.
Himantoides, Butler, Ins. 144.
Hippia, Möschler, Ins. 159.
Hippopotamodon, Lydekker, *Mamm.* 18.
Hippurella, Altman, Cœl. 18.
Hochstetteria, Vélain, Moll. 85.
Holosticha, Wrzesniowski, Prot. 11.
Homaleis, see *Omaleis*.
Homaloblemmus, Saussure, Ins. 214.
Homaloporus, Uhler, Ins. 223.
Homilia, McLachlan, Ins. 200.

- Homogaster, *Provancher*, Ins. 74.
 Homoglaea, *Morrison*, Ins. 168.
 Homophyllia, *Brüggemann*, Cœl. 6.
 Homophyla, *Harold*, Ins. 90.
 Hoplarctia, *Butler*, Ins. 151.
 Hoplopus], *Canestrini & Fanzago*,
 Arachn. 20 [*Laporte*, Coleoptera,
 1832; *Agassiz*, 1848, amending
 Oplopus, *Wesmael*, Hymenoptera,
 1833].
 Hopleorrhiza, see *Oplorrhiza*.
 Hornia, *Riley*, Ins. 68.
 Hupodonta [Hyp-], *Butler*, Ins. 159
 [*Hypodon*, *Haldeman*, Mammalia,
 1842].
 Hyalopomatus, *Marenzeller*, Verm.
 18.
 Hylophorbus, *Macleay*, Rept. 12.
 Hypædalea, *Butler*, Ins. 144.
 Hypbasis, *Harold*, Ins. 90.
 Hypobythius, *Moseley*, Moll. 91.
 Hypoderes, *Lefèvre*, Ins. 85.
 Hyp[ο]lathrinus, *Reitter*, Ins. 39.
 Hypsomadius, *Butler*, Ins. 161.

 Idiophthalma, *Cambridge*, Arachn. 7.
 Ilycrinus, *Koren & Danielssen*, Ech.
 11.
 Intoshia [Macintoshia], *Giard*,
 Verm. 20.
 Irpa, *Koren & Danielssen*, Ech. 4.
 Ischnocarabus, *Kraatz*, Ins. 15.
 Ischnodactylus, *Chevrolet*, Ins. 61.
 Isolemidia, *Gorham*, Ins. 55.
 Isotornus, *Wollaston*, Ins. 75.
 Ivongius, *Harold*, Ins. 85.

 Jebusæa, *Reiche*, Ins. 80.
 Jobia, *Kirsch*, Ins. 89.

 Kallispungia [Calli-], *Wright*, Spong.
 6.
 Katophis [Cato-], *Macleay*, Rept. 9.
 Kaufmannia, *Radoszkowsky*, Ins.
 100.
 Kinetoskias [Cinetoscias], *Koren &*
 Danielssen, Moll. 94.
 Korenia, *Friele*, Moll. 46.
 Krebsia, *Mörch*, Moll. 43.

 Labidophorus, *Kramer*, Arachn. 24.
 Labionaris, *Brocchi*, Rept. 9.
 Labopidea, *Uhler*, Ins. 225.
 Laboulbenia, *Lichtenstein*, Ins. 234.
 Lagenipora, *Hincks*, Moll. 95.
 Lagochila, *Jordan & Brayton*, Pisc.
 26.
 Lamachus, *Stål*, Ins. 212.

 Lampribis, *Elliot*, Aves 56.
 Lamproderma, *Grube*, Verm. 17.
 Lanthanotus, *Steindachner*, Rept. 6.
 Lebinthus, *Stål*, Ins. 216.
 Lecanurius, *Kossmann*, Crust. 32.
 Lenax, *Sharp*, Ins. 34.
 Lepasta, *Möschler*, Ins. 159.
 Lepidonaxia, *Targioni - Tozzetti*,
 Crust. 11.
 Lepidotarphius, *Pryer*, Ins. 184.
 Leptidule, *Butler*, Ins. 153.
 Leptobasis, *Selys*, Ins. 205.
 Leptodiscus, *Hertwig*, Prot. 8.
 Leptophragma, *Zittel*, Spong. 9.
 Leptophysa, *Baly*, Ins. 89.
 Leptoxenus, *H. W. Bates*, Ins. 80.
 Lesbia, *Mulsant*, Aves 34.
 Leucaria, *Mulsant*, Aves 34.
 Lichomolgidium, *Kossmann*, Crust.
 32.
 Ligaria, *Stål*, Ins. 210.
 Lintneria], *Butler*, Ins. 139
 [*Edwards*, Lepidoptera].
 Liocæzio, *Bleeker*, Pisc. 11.
 Liocichla, *Swinhoe*, Aves 47.
 Liogryllus, *Saussure*, Ins. 214.
 Liotropis], *Uhler*, Ins. 223 [*Fitz-*
 inger, Reptilia, 1843].
 Liphoplus, *Saussure*, Ins. 215.
 Liriopsis, *Claus*, Cœl. 16.
 Lissarca, *Smith*, Moll. 85.
 Lithomyza, *Scudder*, Ins. 4.
 Lithortalis, *Scudder*, Ins. 4.
 Lobonotus, *Uhler*, Ins. 223.
 Lomemus, *Sharp*, Ins. 50.
 Lophostethus, *Butler*, Ins. 143.
 Loxioides, *Oustalet*, Aves 48.
 Loxobates, *Thorvell*, Arachn. 12.
 Loxoblemmus, *Saussure*, Ins. 214.
 Lusya, *Nardo*, Crust. 24.
 Lutetina, *Vélain*, Moll. 83.
 Lygdamia, *Stål*, Ins. 209.
 Lysicles, *Stål*, Ins. 212.
 Lyttonyx (? *De Marseul*), Ins. 68.

 Machæroplax, *Friele*, Moll. 46.
 Macintoshia, see *Intoshia*.
 Macroceromys [Macroceratomyia],
 Bigot, Ins. 191.
 Macrocorax, *Sharpe*, Aves 50.
 Macrocystella, *Callaway*, Ech. 12.
 Macrogyllus, *Saussure*, Ins. 213.
 Macroptychia, *Büttger*, Moll. 70.
 Macrostigma, *Rondani*, Ins. 112.
 Magilina, *Vélain*, Moll. 30.
 Mahasena, *Moore*, Ins. 158.
 Mainophis [Mæno-], *Macleay*, Rept.
 9.

- Manatha, *Moore*, Ins. 158.
 Manduria, *Stal*, Ins. 212.
 Manilia, *Mulsant*, Aves 34.
 Margaris, *Schaufuss*, Ins. 29.
 Margarya, *Nevill*, Moll. 42.
 Marionia, *Vayssière*, Moll. 53.
 Marpesia, *Menge*, Arachn. 16.
 Marptusa, *Thurvell*, Arachn. 17.
 Marshallia, *Zittel*, Spong. 10.
 Mastigophora, *Hincks*, Moll. 94
 [-rus, *Poey*, Lepidoptera, 1832].
 Mathesis, *Waterhouse*, Ins. 55.
 Mathoris, *Guénée*, Ins. 161.
 Mauricea, *Carter*, Spong. 6.
 Mayetia, *Mulsant & Rey*, Ins. 24.
 Mecastus, *Sharp*, Ins. 50.
 Mecistocoris, *Reuter*, Ins. 227.
 Megæra, *Simon*, Arachn. 8 [*Des-voidy*, Diptera, and *Wagler*, Reptilia, 1830].
 Megalaster, *Duncan*, Ech. 11.
 Megapora, *Hincks*, Moll. 95.
 Megaspis, *Cope*, Rept. 7 [*Macquart*, Diptera, 1842].
 Meladroma, *Chaudoir*, Ins. 16.
 Melanæma, *Butler*, Ins. 153.
 Melaneros, *Fairmaire*, Ins. 52.
 Melanorectes, *Sharpe*, Aves 39.
 Melissotarsus, *Emery*, Ins. 103.
 Melonycteris, *Dobson*, Mamm. 10.
 Menaka, *Wood-Mason*, Ins. 212.
 Mentissoidea, *Büttger*, Moll. 69.
 Meroligon, *Rondani*, Ins. 112.
 Merragata, *White*, Ins. 226.
 Mesites, *Nikitin*, Ech. 12 [*Geoffroy*, Aves, *Schönherr*, Coleoptera, 1838; *Jenyns*, Pisces, 1842].
 Meskea, *Grote*, Ins. 175.
 Mestra, *Stal*, Ins. 219.
 Metamimas, *Butler*, Ins. 144.
 Metaxoides, *Schaufuss*, Ins. 29.
 Metazumia, *Saussure*, Ins. 98.
 Meterana, *Butler*, Ins. 168.
 Methana, *Stal*, Ins. 208.
 Metilia, *Stal*, Ins. 210.
 Metioche, *Stal*, Ins. 216.
 Metriophyla, *Butler*, Ins. 151.
 Micraulax, *Theobald*, Moll. 77.
 Microcephalus, *Schnabl*, Ins. 197
 [*Lesson*, Reptilia; *Latreille*, Coleoptera, 1825].
 Microcnus, *Reichenow*, Aves 56.
 Microcorax, *Sharpe*, Aves 50.
 Microctonus, *Keyserling*, Arachn. 13 [*Vitzinger*, Reptilia, 1843].
 Microdisopus, *Peters*, Rept. 12.
 Microhoria, *Chevrolet*, Ins. 66.
 Micromerys, *Bradley*, Arachn. 9.
 Micronychus, *Provancher*, Ins. 70.
 Microporella, *Hincks*, Moll. 94.
 Microsorex, *Coues*, Mamm. 11.
 Microvoluta, *Angas*, Moll. 32.
 Mimeupleca, *Butler*, Ins. 156.
 Miogryllus, *Saussure*, Ins. 214.
 Mirus, *Saulcy*, Ins. 30.
 Misocoris*, *Rondani*, Ins. 112.
 Misythus, *Stal*, Ins. 219.
 Mithrenes, *Stal*, Ins. 212.
 Mitrephorus[-rus], *Linstow*, Verm. 12 [*Schönherr*, Coleoptera, 1837].
 Mnesarchus, *Stal*, Ins. 219.
 Mnesibulus, *Stal*, Ins. 216.
 Mnesicles, *Stal*, Ins. 219.
 Mnesilochus, *Stal*, Ins. 212.
 Mærodes, *Waterhouse*, Ins. 62.
 Monobanchus, *Mereschkowsky*, Cœl. 15.
 Monommata, *Bartsch*, Verm. 15
 [rectius Monomma], *Klug*, Coleoptera, 1833].
 Monophorus, *Grillo*, Moll. 37 [-ra, *Quoy & Gaimard*, Mollusca, 1824].
 Monostecchas, *Allman*, Cœl. 18.
 Monura, *Mabille*, Ins. 131 [*Ehrenberg*, Protozoa, 1830].
 Morismus, *Stal*, Ins. 217.
 Moropus, *Marsh*, Mamm. 23.
 Moupinia, *David & Oustalet*, Aves 37.
 Mucronella, *Hincks*, Moll. 94.
 Munda, *Stal*, Ins. 216.
 Mychophilus, *Friwaldszky*, Ins. 94.
 Mycteris, *Mabille*, Ins. 139 [*Agassiz*, 1848, amending *Myctiris*, *Latreille*, Crustacea, 1817].
 Myiomisa*, *Rondani*, Ins. 112.
 Myrcinus, *Stal*, Ins. 210.
 Myrmia, *Mulsant*, Aves 34.
 Mysella, *Vélain*, Moll. 83.
 Mythinia, *Mulsant*, Aves 34.
 Myxolecanium*, *Targioni-Tozzetti*, Ins. 234.
 Nangra, *Day*, Pisc. 23.
 Nanostoma, *Jordan*, Pisc. 10.
 Navosomopsis, *J. Thomson*, Ins. 78.
 Nembrotha, *Bergh*, Moll. 52.
 Nematianta, *Bourguignat*, Moll. 71.
 Neobuccinum, *Smith*, Moll. 31.
 Neocharis, *Sharp*, Ins. 50.
 Neomycta, *Pascoe*, Ins. 72.
 Neotrachia, *Saunders*, Ins. 223.
 Nephrica, *Harold*, Ins. 89.
 Neroidavus, *Grinnell*, Verm. 18.
 Nicæana, *Pascoe*, Ins. 69.
 Nigritomyia [vox hybr.], *Bigot*, Ins. 191.

- Nisibis, *Stal*, Ins. 208.
 Nisyrius, *Stal*, Ins. 212.
 Nortonia, *Saussure*, Ins. 98.
 Nossiceus, *Harold*, Ins. 86.
 Notiosorex, *Coues*, Mamm. 11.
 Notiothauma, *McLachlan*, Ins. 201.
 Notonyx, *Milne-Edwards*, Crust. 16.
 Notoxena, *Chaudoir*, Ins. 17.
 Nyctimus, *Thorell*, Arachn. 12.
 Nyetra, *Baly*, Ins. 83.
 Oceanactis, *Moseley*, Cœl. 3.
 Ochetomyrmex, *Möyr*, Ins. 103.
 Ocnopus, *Reinhardt*, Mamm. 23.
 Octacnemus, *Moseley*, Moll. 91.
 Ochthispa [Ochtherohispa], *Chapuis*, Ins. 93.
 Octomicrus, *Schaufuss*, Ins. 29.
 Odochilus, *Harold*, Ins. 42.
 Odontalgus, *Raffray*, Ins. 30.
 Odontogryllus, *Saussure*, Ins. 214.
 Ecetis, *McLachlan*, Ins. 200.
 Edipus ||, *Menge*, Arachn. 16
 [Tschudi, Reptilia, 1838; Lesson, Mammalia, 1840].
 Olcinia, *Stal*, Ins. 217.
 Olga, *Radoszkowsky*, Ins. 100.
 Oligoptychia, *Böttger*, Moll. 69.
 Omaleis [Ho-], *Allard*, Ins. 62.
 Onchestus, *Stal*, Ins. 211.
 Oomyzus*, *Rondani*, Ins. 112.
 Oo[r]rhiza, *Mereschkowsky*, Cœl. 15.
 Ophielaps, *Sauvage*, Rept. 9.
 Ophiodes ||, *Murray*, Arachn. 21
 [Wagler, Reptilia, 1828; Guénée, Lepidoptera, 1841].
 Ophiopleura, *Koren & Danielssen*, Ech. 8.
 Ophiopteris, *Smith*, Ech. 8.
 Ophrystoma, *Zittel*, Spong. 10.
 Opisa, *Boeck*, Crust. 22 [DeFrance, Mollusca, 1825; Opis, Krøyer, Crustacea, 1842].
 Oplorhiza [Hoplorrhiza], *Allman*, Cœl. 16.
 Opsigonus, *Baudi*, Ins. 65.
 Orbifrons, *Staudinger*, Ins. 168.
 Orbuliniella, *Entz*, Prot. 7.
 Oreopsittacus, *Salvadori*, Aves 30.
 Orthonus, *Miers*, Crust. 24.
 Ostomodes, *Reitter*, Ins. 35.
 Othria, *Westwood*, Ins. 147.
 Otilen, *Lefèvre*, Ins. 85.
 Ottonia, *Kramer*, Arachn. 21.
 Oxus, *Kramer*, Arachn. 21.
 Oxybeloides, *Radoszkowsky*, Ins. 101.
 Pachycotes, *Sharp*, Ins. 76.
 Pachymastax, *Wollaston*, Ins. 75.
 Pach[y]odynerus, *Saussure*, Ins. 98.
 Pachyopsis, *Uhler*, Ins. 229.
 Pachyteichisma [-ti-], *Zittel*, Spong. 9.
 Paclabius, *Kossmann*, Crust. 32.
 Pallachira, *Grote*, Ins. 171.
 Pamerocoris, *Uhler*, Ins. 225.
 Panceria, *Andres*, Cœl. 5.
 Panspæus, *Sharp*, Ins. 49.
 Pantarbes, *Osten-Sacken*, Ins. 192.
 Pappophis, *Macleay*, Rept. 10.
 Paracadmus, *Baly*, Ins. 84.
 Paracephala, *Baly*, Ins. 84.
 Paracosmus, *Osten-Sacken*, Ins. 193.
 Paradanuria, *Wood-Mason*, Ins. 210.
 Paracecus, *J. Thomson*, Ins. 78.
 Parapholis, *Uhler*, Ins. 229.
 Paraphytus, *Harold*, Ins. 41.
 Parapilumnus, *Kossmann*, Crust. 14.
 Parendymia, *Kirsch*, Ins. 73.
 Parinus, *Sharp*, Ins. 50.
 Parmius, *Sharp*, Ins. 55.
 Paroxya, *Scudder*, Ins. 219.
 Pasticus, *Stal*, Ins. 217.
 Paupris, *Sharp*, Ins. 55.
 Paussotropus, *Waterhouse*, Ins. 18.
 Pechiosea, *Butler*, Ins. 155.
 Peltocoxa, *Catta*, Crust. 23.
 Peltostoma, *Reitter*, Ins. 35.
 Pentarthrodes, *Wollaston*, Ins. 75.
 Perignamptus, *Harold*, Ins. 43.
 Periphetes, *Stal*, Ins. 212.
 Perissocerus, *Smith*, Ins. 110.
 Peristoreus, *Kirsch*, Ins. 72.
 Petrobia, *Murray*, Arachn. 22 [-bius, Leach, Orthoptera, 1817; Brullé, Coleoptera, 1836].
 Phainoptila [Phæn-], *Salvin*, Aves 37.
 Phaloria, *Stal*, Ins. 216.
 Pharmacia, *Stal*, Ins. 212 [-macis, Hübnér, Lepidoptera, 1816].
 Phedusia, *Müschler*, Ins. 159.
 Pheloticus, *Harold*, Ins. 85.
 Phleusa, *Nardo*, Crust. 21.
 Phonergates, *Buck*, Prot. 7.
 Phrixolepia, *Butler*, Ins. 160.
 Phyllocomus, *Grube*, Verm. 17.
 Phyllolabis, *Osten-Sacken*, Ins. 190.
 Phyllopezus, *Peters*, Rept. 8.
 Physetoporus, *Horn*, Ins. 25.
 Picobia, *Haller*, Arachn. 24.
 Piezocranium, *Horváth*, Ins. 225.
 Pinarolestes, *Sharpe*, Aves 39.
 Pitasila, *Moore*, Ins. 156.
 Pithecistes, *Cope*, Mamm. 9.
 Plagiostomum, *Gramma*, Verm. 9 [-ma, Sowerby, Mollusca, 1812].

- Platamops, *Reitter*, Ins. 37.
 Platydoris, *Bergh*, Moll. 51.
 Platypes, *Lockington*, Crust. 11
 [-pus, *Herbst*, Coleoptera, 1793 ;
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